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COMPUTERWORLD

IS sites hear rumble of war

BY RICHARD PASTORE
CW STAFF

"We hear the flights taking off for Kuwait and Baghdad. You can't sit here and listen to these planes leave without being kind of anxious."

For Mark Ragel and other Americans working in data centers in the Middle East, growling U.S. warplanes and screeching air-raid sirens replaced the purr of printers and tape drives as U.S. military and allied forces bombed Iraq and Kuwait last week.

As of Thursday evening, these expatriates had finished battening down the information centers and were at home with their families waiting out the unfolding drama.

Ragel is a database administrator at the refinery site of Bahrain Petroleum Co. in Bahrain, a Persian Gulf island nation within sight of Saudia Arabia's eastern coast. The refinery is considered a primary target for Iraqi President Saddam Hussein in his bid to thwart efforts to force his occupying army from Kuwait.

High-tech weaponry *such as the Stealth fighter has quelled fears about U.S. military reliance on gadgetry, as various systems are proving effective in the Gulf war. Page 84.*

Correspondingly, the work force at the site has been reduced to a skeleton crew of essential personnel.

Leading up to the United Nations' deadline last week, Ragel backed up his refinery study data and, for the first time, moved it to an off-site vault in Bahrain. The firm also relocated its payroll and personnel records.

At Aramco, Saudi Arabia's oil conglomerate and site of one of the world's largest IBM installations, security has also been augmented, according to John Scarritt, business systems analyst in

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Officevision on hot seat as SAA boss takes over

BY ROSEMARY HAMILTON
and PATRICIA KEEFE
CW STAFF

IBM's troubled Officevision project has been placed under the direct management of Earl Wheeler, the company's head of Systems Application Architecture strategy.

The second release of Officevision has experienced continued delays on most supported platforms.

Industry observers contacted last week said the recent management shuffle that removed development responsibility from the Applications Solutions Division is an attempt to rescue the development effort. IBM said the organizational moves are not directly related to Officevision delays.

Noting that Wheeler, general manager of Programming Systems, has a track record of getting tough jobs done, some analysts also pointed out that he is now managing all of the major SAA product lines.

The other major SAA initiatives are OS/2, AD/Cycle and Systemview. Unlike those systems-oriented development efforts, however, Officevision was the first user-oriented application suite that was intended to provide distributed access to electronic mail, group calendars and other office-oriented functions.

Several analysts and users

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Windows role to grow

Microsoft looks to blend 32-bit version with OS/2

BY PATRICIA KEEFE
CW STAFF

Microsoft Corp. is pushing Windows 3.0 — not Presentation Manager — compatibility as the core of its so-called Portable OS/2, which it will detail next week, according to independent developers briefed by the firm.

Under Microsoft's plan, users would be able to run any applications based on DOS, Windows or OS/2 under what the firm is calling New Technology Portable OS/2. That version of OS/2, also referred to as OS/2 Version 3.0, will run on reduced instruction set computing devices and other non-Intel Corp. technology and Intel-based personal computers.

In a memo to independent developers obtained by *Computerworld*, Microsoft claimed it will be able to differentiate its high-end operating systems (New Technology Portable OS/2) and its low-end DOS operating systems in the market while providing single application programming interfaces for software developers to write to.

According to sources who were briefed by Microsoft, New Technology Portable OS/2 will

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Morris case impact slight

BY MICHAEL ALEXANDER
CW STAFF

One year ago today, a jury in U.S. District Court in Syracuse, N.Y., found Robert T. Morris guilty of injecting a worm into a nationwide computer network that sabotaged thousands of computers. Though Morris clearly got the message that releasing a computer worm is a crime, legal and computer experts remain divided on whether the conviction has had an impact on computer crime and security.

Bob Mahoney

Morris sent *worm to more than 6,000 computers*

"It is disappointing to see how little the Morris case has done to energize government and industry to improve computer security," said Kenneth Rosenblatt, an attorney who heads the high-technology unit of the Santa Clara District Attorney's office in San Jose, Calif. "I am also concerned by how little effort there has been to teach ethics to computer users."

Immediately following the trial, prosecutors and computer experts predicted that the conviction would send a clear warning to the nation's hackers

Continued on page 4

VDT monitoring under stress

BY MITCH BETTS
CW STAFF

When VDT users call the Computer Spying Hotline, they unload tales about how demoralizing it can be when supervisors use computer software to monitor every keystroke and error, every transaction and work break — and then post the numbers on the company bulletin board.

"It's a nightmare," said a data entry clerk in Rhode Island who called herself Rita F. "Everyone knows how many seconds you spent in the bathroom. It's like kindergarten," she told the hot line, which is run by the union-affiliated National Association of Working Women, based in Cleveland.

Unions and other critics argued that computer monitoring of VDT work leads to stressed-out employees toiling in an electronic sweatshop, where failing to meet a production quota leads to dismissal.

But it does not have to be that way. Research shows that computer-based performance monitoring can be used effectively and humanely to supplement human supervision if managers involve employees in developing fair monitoring practices, keep the data confidential

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Executive Report — How do you make a wild network behave or keep it from skittering out of control in the first place? Page 53.

In Depth — Trends show minorities rarely make it to the top spots in IS. Page 57.

AT&T claims victory in shareholder vote for NCR takeover, but final outcome remains elusive. Page 4.

IBM solid, DEC better than expected as financial reports come out. Wang, meanwhile, says latest layoff report reflects continuation of earlier plans. Stories, page 8.

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"The reliance on electronic monitoring is almost forcing managers to manage poorly in terms of human relations."

MICHAEL SMITH
UNIVERSITY OF WISCONSIN AT MADISON

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The 5th Wave

"WAIT A MINUTE – SINCE WHEN DOES OUR LOCAL-AREA NETWORK INCLUDE SIX TERMINALS, TWO PRINTERS AND A MISTER BEAN ESPRESSO MACHINE?"

EXECUTIVE BRIEFING

■ **U.S. employees in Middle East data centers** watched anxiously on "a very high state of alert" as war broke out in the region. Corporate data sites in Saudi Arabia and other Arab nations, already reduced to skeleton crews before the fighting began, nevertheless ran operations pretty much as usual. Extra backup precautions have been taken, including off-site vault storage and preparation of disaster recovery sites out of the region. The early success of U.S. air strikes against Iraq allayed fears that sophisticated high-tech weaponry would fail under battle conditions. In Menlo Park, Calif., the Unix-based international network Peacenet brought war news advisories to systems users in 50 countries. **Pages 1, 84.**

■ **Veteran Mellon Bank IS Chief George DiNardo** is considering starting his own outsourcing company, among other options, after his surprise resignation from Mellon. The outspoken DiNardo is also mulling other IS management job offers and a consulting career. Mellon started its search for a replacement. **Page 6.**

■ **Microsoft will eventually merge Windows and OS/2,** sources said. In three to five years, what is now known as Portable OS/2 will support both Presentation Manager and Windows. In the meantime, the desktop migration issue will remain murky. **Page 1.**

■ **IBM is trying to jump-start Officevision** with a change in management. It is now the province of SAA boss Earl Wheeler. The ballyhooed — but long overdue — application has some users saying, "We can no longer wait for IBM." **Page 1.**

■ **Network management's most difficult challenges** are often the most routine. Conditions resulting from fast growth, a proliferation of different LANs and neglect of documentation cause the greatest headaches, rather than exotic expansions such as ocean-floor cabling. **Page 53.**

■ **Computer-based performance monitoring** has come under fire from unions and employee associations. Although it is used effectively and fairly by some firms, it can cause employee stress and anger when Big Brother-type fears are realized. **Pages 1, 14.**

■ **Despite NCR shareholders' overwhelming vote** in favor of AT&T's takeover offer, NCR's board will continue to be able to resist the bid. The board holds the power to set the next meeting date, which analysts said may not be until May. Separately, 22 members of Congress called for a federal review of the proposed merger's impact on the competitiveness of the U.S. computer industry. **Page 4.**

■ **One year after the conviction** of hacker Robert T. Morris, computer security experts are disappointed at the lack of action taken by government and industry. But others say would-be hackers have gotten the message that computer crimes will no longer be dealt with as mere pranks. **Page 1.**

■ **Life after layoffs:** Part two of this series looks at how one IS professional made the best of a bad situation through contract work. **Page 67.**

■ **On-site this week:** Grid Systems' handheld Gridpad is the latest crime-fighting weapon in the arsenal of the San Jose, Calif., police department. **Page 37.** The Chicago public school system seeks to rebuild with the help of a Unisys 2200-based on-line student database and the placement of terminals in 17 schools. **Page 25.** Elsewhere in academia, Boston University is on a "no-tape" campaign to replace all of its storage media as part of a larger plan to implement unattended operations. **Page 29.**

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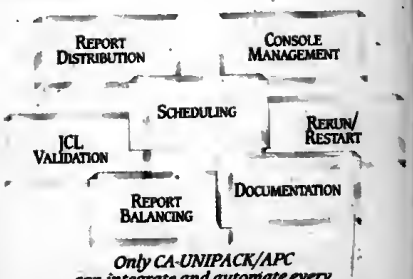

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AT&T pushes plan to oust NCR board

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — Despite the resounding "yes" vote NCR Corp.'s shareholders gave to AT&T's bid for control of the Dayton, Ohio-based computer maker, it appears that NCR can continue to shun the overtures of the giant telephone company until at least May.

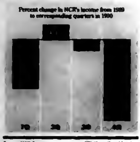
"Nothing has changed, except for the fact that in a fairly strong voice, the shareholders have said to the NCR board, 'We want this deal to go through,'" said David Schofield, an analyst at Duff & Phelps Investment Research Co. in Chicago.

AT&T announced last Wednesday that it had received 44,688,030 — or 70% — of NCR's shares in response to its $90-per-share, all-cash offer for NCR. AT&T also extended its tender offer through midnight Feb. 15.

AT&T needed two-thirds of the shares to force a special meeting to remove a majority of NCR's board. But hours later, NCR's board came out of its regularly scheduled meeting insisting that AT&T's offer was "grossly inadequate" and reasserted its desire to keep the company independent.

Crumbling defenses?

Shareholder support for NCR's battle against AT&T's takeover attempt is unlikely to be bolstered by the fourth-quarter profit slide



Source: NCR Corp. CW Chart: Tom Monahan

AT&T said a separate proxy asking for a special board meeting had received a positive response from over 50% of NCR's shareholders — more than double the necessary 25%. However, to remove NCR's board at a special meeting would require that 80% of the shareholders vote in favor. Some analysts speculated that AT&T extended its tender offer to see if it could gain this margin of support on its tender.

Meanwhile, NCR posted record, but disappointing, revenue and earnings for 1990 on the Monday before AT&T's announcement. NCR showed a 6% jump in revenue over 1989, to $6.2 billion, and only a 1% jump in earnings per share, to $5.43. Analysts had expected as high as $5.75 per share. Earnings were inflated by NCR stock buy-backs during the course of the year, as actual income fell by 10% to $369 million.

Barry Bosak, research analyst at Smith Barney, Harris, Upham and Co., suggested that NCR's stance against the merger could be a delaying tactic.

"It's quite possible that NCR's board doesn't feel pressured right now to do anything," Bosak said. "They may need more time to arrive at a strategy — there's no gun at their head."

NCR holds discretion over the meeting date and does not have to call a special meeting for several months. It may not call one until after its annual meeting on April 17.

AT&T's offer remains conditional on NCR's board exempting the deal from Maryland antitakeover laws and invalidating its poison pill defense. Cases filed by both parties are proceeding in federal district court in Dayton. AT&T has no control over any shares tendered until a deal is consummated.

In a move seemingly related to Congressional concerns (see story below), NCR last week charged in a court filing that AT&T's proposed financing violates prohibitions on the phone company using revenue of its regulated businesses to fund non-regulated businesses. Additionally, NCR charged AT&T should be classifed as a bank-holding company because of its credit card business, and therefore prohibited from acquiring non-banking businesses.

Congress presses Bush to review AT&T bid for NCR

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Twenty-two members of the U.S. House of Representatives challenged the hostile takeover of NCR Corp. by AT&T last week and asked President Bush to review the proposed deal for its effects on the competitiveness of the U.S. computer industry.

"Hundreds of millions of dollars and tens of thousands of jobs have been lost in [previous industry mergers], substantially weakening the American computer industry," the bipartisan group wrote in a letter to the president.

Better uses

The lawmakers pointed out that NCR is a net exporter of computer equipment — deriving 60% of its revenue abroad — and suggested that this positive contribution would be jeopardized by the merger. They also said the $6 billion in debt needed by AT&T to finance the deal would steal scarce dollars from a pool better used to finance plant expansion, research and development and other investments needed for economic growth.

The letter to Bush asks that the merger be reviewed by the President's Council on Competitiveness, which is headed by Vice President Dan Quayle.

A spokesman for Rep. Tony Hall (D-Ohio) said the council's reply would probably not be a prelude to legislation blocking the merger but would help Congress decide what action, if any, it should take on the broad policy issues concerning computer company mergers in general. Such action could include hearings, letters to regulatory agencies or legislation, he said.

The letter is the second expression of concern about the merger from Capitol Hill. On Jan. 11, several members of the House Telecommunications and Finance Subcommittee asked the Federal Communications Commission to determine whether the takeover would serve the public interest.

A spokesman for the FCC would not comment on the letter but said last week that FCC Chairman Alfred C. Sikes would respond to the letter by Jan. 25.

Morris

FROM PAGE 1

that computer trespassing would no longer be tolerated and that it would also serve to heighten computer security at institutions all over the nation.

Thomas Guidoboni, the Washington, D.C., attorney who continues to represent Morris, said the impact of the case has been "virtually nil." Guidoboni filed an appeal in December, which is now pending.

Morris was the first person to be convicted of releasing a worm under a provision of the Computer Fraud and Abuse Act of 1986. Claiming the law is vague and should be revised, Guidoboni said Congress has failed to enact legislation aimed specifically at computer viruses and worms, despite recommendations by the U.S. Justice Department, the U.S. Government Accounting Office, security experts and others. Computer security measures on Internet has improved little as a result of the worm attack, he added.

More conscious

At the Lawrence Livermore National Laboratory, "we are far more security-conscious as a result" of the Morris case, said Kevin Oberman, network manager at the Lawrence, Calif.-based institute. The laboratory expended "hundreds of very expensive man-hours" battling the worm program, he said.

However, the conviction and subsequent sentencing has done little to deter hackers, Oberman said. "Probes [by hackers] on the lab's computers have grown more frequent."

Still, some hackers may have also gotten the message that releasing viruses and worms will no longer be viewed as mere pranks, said Cliff Stoll, an astronomer at Harvard University's Smithsonian Astrophysics Laboratory and author of the best-seller, *The Cuckoo's Egg*, which detailed hackers turned spies for the KGB. "In the past year, the Morris conviction has had an interesting effect, and that is that there have not been any copycats," he said.

While enrolled as a computer science graduate student at Cornell University, on the evening of Nov. 2, 1988, Morris set loose a worm that he later claimed he thought would deposit a single copy of itself on every computer it encountered on the Internet. However, a programming error caused the worm to replicate wildly and clog the memories of more than 6,000 computers. At his trial, Morris said the program was written as an academic experiment that quickly proved to be a "dismal failure."

Paying the price

Last May, Morris was sentenced by a federal judge in Syracuse to three years' probation and a $10,000 fine. In addition, he was ordered to perform 400 hours of community service and to contribute approximately $90 per month toward the cost of his supervision while he is on probation.

Morris is currently working as a programmer at a software company in Cambridge, Mass., according to Guidoboni. However, he declined to name the company.

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NEWS SHORTS

D&B Software restructures

Describing the move as part of a "strategic plan to better meet the worldwide needs of its customers," Dun & Bradstreet Software has restructured its U.S. and international field organizations into three regions: the Americas, Europe and Asia Pacific, with the divisions to be headed up by Tom McNeight, Pierre Donaldson and Roger Evans, respectively. In related news, Michael Hunt, executive vice president of D&B Software's International Operations, is leaving the company next month to pursue entrepreneurial opportunities. Hunt is departing after 13 years of service.

Novell to settle shareholder suits

Several class-action lawsuits that originally sought to stop Novell, Inc. from merging with Lotus Development Corp. last spring will be settled this week, according to Novell legal counsel David Bradford. Shareholders who filed the suits will receive "a very small sum of money to cover a small portion of their legal fees," Bradford said last week. He would not comment further on the settlement.

Prime ports Information Plus

Prime Computer, Inc. announced last week that Prime Information Plus, the company's Pick-based database management system, and Prime EXL Portable Netware are now available across the vendor's complete range of Unix systems. Prime has also extended its EXL MBX Unix-based product line with the EXL MBX 486. The system uses an Intel Corp. I486 processor, supports as many as 74 asynchronous connections and offers up to 64M bytes of memory. Pricing starts at $15,900.

Sybase, NCR plan port

Sybase, Inc. and NCR Corp. said last week that they will work together to port Sybase's SQL Server database engine to NCR's 3600 and 3700 Unix machines. The NCR computers, based on the Intel I486 chip, run Unix System V, Release 4. Sybase will be porting Release 4.8 of its relational DBMS to the NCR machines, a version that supports symmetrical multiprocessing but has not been shipped to end users. The Sybase SQL Server was previously available for some low-end MS-DOS NCR machines.

Portable lines grow

NEC Technologies, Inc. added an Intel 80286-based notebook, the Ultralite 286F, to its product line last week. The 12-MHz 286F weighs 6.8 pounds, has a battery life of 3½ hours and has an IBM Video Graphics Array-compatible screen. The machine is available now and retails for $2,999. Meanwhile, Fora, Inc. in San Jose, Calif., released a $4,995 laptop based on Intel's 20-MHz 80386 chip. The new machine, called the LP-386C, weighs 14 pounds, comes with 2M bytes of memory expandable to 8M bytes and a 40M-byte hard drive.

Low-end VAX 4000 due

Digital Equipment Corp. will add a low-end model to its VAX 4000 line this week, along with the first model of a Vaxstation 4000, company officials confirmed. Priced under $35,000, the VAX 4000 Model 200 will support 10 users. An upgrade to the Vaxstation 2000 line will add X Windowing terminal capabilities, while a later release of the X Window System upgrade will bring that ability to older Vaxstations as well.

Galvin chairs Sematech

You can still call him 'Mr. Chairman,' but say it twice: Motorola, Inc. executive committee Chairman Robert W. Galvin was elected chairman of the board last week at Austin, Texas-based semiconductor research consortium Sematech. Galvin, 51, spent three decades at Motorola's helm. He replaces National Semiconductor Corp. Chief Executive Officer Charles Sporck, who will remain a Sematech board member.

More news shorts on page 83

IS exec charts his own course

Mellon Bank's IS Chief DiNardo resigns his post to pursue new interests

BY CLINTON WILDER
CW STAFF

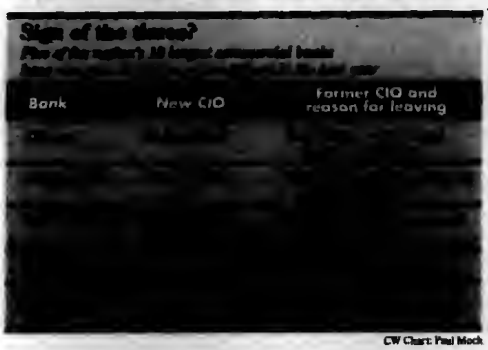
PITTSBURGH — Can a 21-year information systems veteran turn into an outsourcing entrepreneur? That is one of many questions George P. DiNardo is pondering after announcing his surprise resignation earlier this month from the top IS executive post at Mellon Bank Corp.

DiNardo, one of the IS community's most outspoken and colorful members, said he left to pursue a new interest — he just has not yet decided what that interest will be. The possibilities include starting an outsourcing firm, consulting or continuing in IS management as chief information officer at a new company. "There is nothing that's a boundary," DiNardo said.

DiNardo, 53, resigned as executive vice president of information management and research. His former boss, Keith Smith, vice chairman of service products, will run IS at Mellon until a replacement is found. A bank spokeswoman said the search will include both inside and outside candidates.

Although DiNardo said he left on good terms, industry sources speculated that he may have been stymied by senior management on some technology efforts. "George is one of the most capable technology guys around, and Mellon's environment right now is anything but 'let's foster technology,'" said banking IS consultant M. Arthur Gillis, president of Computer-Based Solutions, Inc. in New Orleans.

Before DiNardo's departure, he was aggressively expanding Mellon's business selling IS services to other banks and some customers in other industries.



CW Chart: Paul Mock

DiNardo recently hired R. Scott Thiessen, a former regional manager at IBM, to head up marketing for outsourcing services.

Mellon sold such services to smaller banks for many years before the current outsourcing trend took off. Last fall, Mellon scored a major win in outsourcing when Dollar Dry Dock Bank of New York, a $5 billion bank, signed a six-year contract for Mellon's outsourcing services.

DiNardo stressed that no matter what his next move is, he feels it is time for a change. "Some people have told me I'm nuts, but this was the last shot I had," he said.

The news caught DiNardo's longtime colleagues by surprise. "It just happened so quickly," said 30-year Mellon veteran David A. Moore, senior vice president of information processing.

"George provided the technology leadership that has taken us to our current position," Moore said, adding, "It has been a long, good relationship."

HP and CA team up on Unix effort

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — In the computer industry's latest marriage of convenience, Hewlett-Packard Co. and Computer Associates International, Inc. said last week that they will jointly develop Unix software for HP systems.

CA also said it has joined Unix International and the Open Software Foundation (OSF).

The development deal calls for HP and CA to work together on systems management, database and applications software. Neither party would release financial details of the arrangement, saying only that it calls for a commitment of technical expertise and personnel and for some money to change hands. Although both parties will market the software, CA will sell it.

The agreement was characterized by industry watchers as one that is likely to benefit both companies. It gives CA a broad-based entry into the Unix market and a new customer set and provides HP with mainframe-class systems management solutions to woo large commercial users to its 9000 series. The HP 3000 series is not included in the agreement.

"It makes sense," said Myron Kerstetter, an analyst at Gartner Group, Inc. in Stamford, Conn. "It moves to HP a set of technologies they're not building themselves, and it gives CA some new life potential."

Another observer agreed. "HP needs this stuff," said David Card, an analyst at International Data Corp. in Framingham, Mass. "This will provide mainframe-style systems management solutions for its distributed Unix systems."

What is the deal?

The deal means "Unix can compete with proprietary systems for [on-line transaction processors]," said Dean O. Morton, HP's chief operating officer.

The first phase of the agreement involves systems management tools for the HP/UX operating system to be delivered within the next 12 months. These include such tools as packages for tape and disk management, automated production control, security, data center administration and performance management and accounting.

These will mirror CA's existing packages on IBM mainframes and Digital Equipment Corp. machines. "The Unix software will be fully integrated into our products," said Charles Wang, CA's chairman and chief executive officer.

After the systems software has been delivered, HP and CA will work on HP/UX versions of CA's IDMS and Datacom database management systems and possibly a stand-alone database system for HP/UX. In addition, there will be a suite of business applications, including accounting, manufacturing and human resources.

Still, the implementation could be a bit tricky. HP has announced it will adopt the OSF's OSF/1 operating system as its base during the next few years. Both companies promised a more detailed schedule of what they will do and when by mid-year.

CA already sells two Unix graphics packages — Dissplá and Intelligraf — in the scientific market, and last September, it announced it is working on Unix versions of its IDMS and Datacom database systems.

Finance review forces Informix to reduce work force, projects

BY JEAN S. BOZMAN
CW STAFF

MENLO PARK, Calif. — Informix Software, Inc. said last week that it expects to report at least three losing quarters for 1990 after restating its revenue and earnings in accordance with a revised revenue-recognition policy. The relational database management system company also did some internal restructuring, slashing 200 of 1,300 jobs and cutting back on marginal projects.

Informix Chief Executive Officer Phil White said the move came because the financial community was concerned about the firm's cash flow, which was reported as $145 million in 1989. Under the new rules, White does not expect profitability to return "any sooner than the second quarter."

Informix has virtually no direct sales force, relying instead on sales from a network of 2,000 value-added resellers, OEMs and distributors, which are also facing difficult economic times. As a result, accounts receivable stretched to 200 days instead of the preferred 90 days.

"We were basically financing our customers," Informix founder and Chairman Roger Sippl said. "We were signing contracts that recognized revenue within 12 months of the signing of a contract. That is typical of our market segment, but it's certainly way longer than the 30 to 90 days typical for most business transactions," he added.

The restructuring cost is expected to run to $6 million, not including the one-time 1990 charge caused by restating the firm's cumulative revenue since its inception 10 years ago.

White said the company had shifted nearly all of its customer support activities to its Menlo Park headquarters and had cut back on several research and development projects.

Users of Informix's office automation software, including the Wingz spreadsheet package, will now have to pay maintenance fees to receive telephone support.

A project that would have moved the Informix RDBMS to Digital Equipment Corp.'s VMS operating system was cut, along with one to develop some new natural language user interfaces.

The layoff of 200 employees comes two years after Informix laid off 110 workers — about 10% of its work force — following its merger with Innovative Software, Inc., in Lenexa, Kan.

IS holds steady during recession

BY CAROL HILDEBRAND
CW STAFF

The U.S. government has finally acknowledged a recession, but for most IS organizations, the budgetary fat-trimming has been going on for several years. For them, it is business as usual.

A report released by Input, a Mountain View, Calif., research firm, examined responses from approximately 100 companies spread throughout 13 market sectors on the impact a possible recession would have on information systems.

"For the most part, we did not find IS groups reacting significantly to the threat of a recession," said Doug Tayler, director of research. "Corporate IS has been under the budget eye for three years, and '91 might be another year like the last three, only just a little tougher."

Tayler said that given the current economic situation, he was surprised to find that 78% of the respondents lacked some sort of built-in contingency plan. "It's not as organized as it might have been in the early '80s," Tayler said.

Stretching dollars, resources

At Southern New England Telecommunications Corp. in New Haven, Conn., some of the belt-tightening has come as a boon. Raymond Fletcher, general manager of information systems and technology, said his staff has been cut by a little more than 20% during the past three years.

Fletcher said that while the budget was remaining flat, he thought his staff was taking advantage of new tools to do more work on the same budget. He also said he makes the dollars stretch by getting resources from other parts of the company. For example, he has about 50 "vendor" programmers — employees who are supervised by his staff but paid for by other segments of the company.

Tayler said there has been enough concern in IS groups that it is beginning to affect prioritizing of application development. "Given recession pressures, there's a preference to get a fewer projects farther along," he said, adding that operating systems were frequently targeted for speed while administrative projects tend'd to land on the shelf or, in a few cases, were canceled.

Fletcher said he is not postponing any projects yet, but that will be the next step if the economy worsens.

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IBM wary despite 1990 success

BY NELL MARGOLIS
CW STAFF

Although IBM last week reported double-digit revenue and profit surges for both the year and quarter ended Dec. 31, Chairman John Akers chose to look beyond the bottom-line rebound and focus on more worldly issues.

"For the future, I know we all hope for a rapid end to the fighting [in the Middle East], as few casualties as possible and quick restoration of an enduring peace," Akers said.

Fourth-quarter revenue of $23.1 billion marked a 12.7% increase for the firm. Quarterly net income climbed 316% from $591 million in last year's comparable period to $2.5 billion — an impressive leap, according to analysts, even considering that last year's comparable quarterly net income was depressed by a huge onetime restructuring charge.

Product sales, which rattled Wall Street by decreasing year-over-year last quarter, rebounded this quarter, increasing 8%.

Annual profit rose 60.2% to $6 billion, on revenue up 10.1% to $69 billion. Revenue from international operations, totaling $41.9 billion, was up 13.3% over last year — the first time in IBM history that non-U.S. revenue growth has surpassed growth in U.S. sales.

Despite the upbeat financial picture, Akers injected a note of caution. "Clearly, we are dealing with very uncertain conditions that are affecting our markets and economies worldwide," he said.

Robert Djurdjevic, president of Phoenix-based Annex Research, also warned against taking "this truly spectacular quarter as guidance for 1991."

"IBM's earnings were right about what we expected," said Jay Stevens, an analyst at Dean Witter Reynolds, Inc. "Their product comments, ditto. I share their concern with regard to the worldwide economic crisis."

"My one reservation is that I'm still not real happy with their cost and expense level," said Martin Ressinger, an analyst at Duff & Phelps, Inc.

However, he said he was heartened by the fact that IBM clearly shares that concern. Addressing analysts in a teleconference last week, Ressinger said, IBM director of investor relations Jim Clifford "told us, 'We're on a headcount vendetta — this is an ongoing thing.' "

In other earnings news, Microsoft Corp. reported a 53% increase in revenue, to $460 million, compared with the same quarter a year earlier. Profits were up 52%, to $112.9 million.

Microsoft officials said international revenue accounted for 55% of the total sales of finished goods. Additionally, the company said, more than two million copies of Windows 3.0 have now been distributed.

Apple Computer, Inc. reported fourth-quarter earnings up 21% to $150.5 million, on revenue of $1.7 billion — a 12% increase. Chairman John Sculley credited the well-received introductions of the Macintosh Classic, Macintosh IISI and Macintosh LC for the increases.

One analyst took a more cynical view. David Wu at S.G. Warburg & Co. said Apple looks "terrific in the comparison" to disappointing results one year earlier.

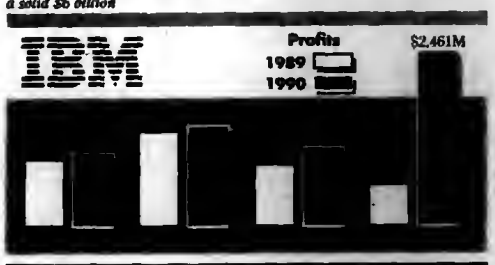
As forecast by analysts [CW, Jan. 14], Intel Corp. bucked the problems besetting many of its competitors in the semiconductor sector to log impressive quarterly and annual increases. Intel's $1 billion quarterly revenue and $164 million net income marked respective 17% and 34% rises. For 1990, the company posted revenue of $3.9 billion, up 26%, and net income of $650 million, up 66%.

On-line transaction processing player Tandem Computers, Inc. saw quarterly revenue edge up 2% to $443.8 million, as worldwide economic woes diluted the effects of cost containment.

Tandem's quarterly profits plummeted 77% to $7 million.

What a difference a year makes

With revenue of more than $69 billion in 1990, IBM profits tallied up to a solid $6 billion



Source: IBM
CW Chart: Paul Mock

DEC surprises Wall Street analysts

Despite success, questions remain on research and development cutbacks

BY NELL MARGOLIS
CW STAFF

MAYNARD, Mass. — A collective sigh of relief from Wall Street was almost audible last week as Digital Equipment Corp.'s fourth-quarter earnings met and beat analysts' expectations.

Analysts conceded that DEC's $11.1 million net income for the quarter ended Dec. 31 — down 28% from the figure logged in the comparable 1989 period — is not the stuff that raves are made of. Neither, they said, would the firm's 5.3% revenue rise to $3.35 billion usually spark such celebration. "The thing is," one analyst said, "we expected so much worse."

"I wouldn't say that DEC is out of the woods yet," said Marc Schulman, an analyst at UBS Phillips & Drew, "but it's out of the heart of the forest. I think in the past months we've seen the fundamental bottoming-out of DEC."

Encouraging remarks

More than from the bottom-line numbers, Schulman and others said, analysts drew encouragement from remarks made by DEC Senior Vice President of Operations Jack Smith during a teleconferenced briefing on the earnings report and from specific line item results that augured well for quarters to come.

While hardware revenue declined 1%, the company logged a 16% growth in software and services — the area in which DEC has repeatedly staked its future. Moreover, Labe, Simpson, Inc. analyst Jean Orr said, "Smith led us to believe that this is sustainable growth."

Also heartening, Orr said, were signs that DEC's cost-control initiative is having some effect. Quarter-to-quarter figures, Orr said, showed research and development expenses "basically flat for the past four quarters." Services, general and administrative (SG&A) expenses, "where the pressures are more difficult to control, showed relatively small quarter-to-quarter increases — another hopeful sign," Orr said.

Some analysts questioned the long-term prudence of DEC's selecting R&D expenses as the costs to contain. Nevertheless, they applauded the short-term implications.

"They've got to start holding the line somewhere," said John B. Jones Jr., an analyst at Montgomery Securities. "I'd rather see them get more aggressive on SG&A instead, but what can you say? A start is a start."

Users not worried

Users, too, appeared willing to give DEC the benefit of the doubt on R&D. "I would be very concerned if holding back on R&D in order to cut costs stopped research that leads to new products or to product upgrades," said Sho Itomura, section head in charge of computer operations at the Honolulu Board of Water Supply, a VAX user site. "But I haven't seen any decrease in DEC's support or products over the past year. I'm not worried at this point," Itomura added.

DEC's product plans could well render the question moot, analysts noted.

"DEC has set itself a rather ambitious development schedule," said Martin Ressinger, an analyst at Duff & Phelps, Inc. "It's difficult to see how the company can hold the line on R&D and still roll out everything they say they will, when they will."

Can the company hold the line on R&D? According to Jones, "not if they want to be Masters of the Universe."

Relief value

DEC closed out its second quarter with profits that exceeded expectations

digital

	Revenue	Income
Q3 '90	$3.26B	$24.9M
Q4 '90	$3.37B	$256.7M
Q1 '91	$3.09B	$26.2M
Q2 '91	$3.35B	$11.1M

Source: Digital Equipment Corp.
CW Chart: Doreen St. John

Wang addresses memo, squelches layoff rumors

BY NELL MARGOLIS
and SALLY CUSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. officials downplayed last week the existence of an internal memo confirming an upcoming 500-person work force cut.

Chief Executive Officer Richard Miller issued the memo to stanch a flood of rumors of massive layoffs about to hit Wang "in numbers that far exceeded anything that was actually going to happen," a spokeswoman said.

Wang officials maintained that the layoff of 500 employees over the next several weeks is not a new program but part of an ongoing one announced in late 1989 when Miller took the helm of the then-foundering firm.

Wang users appeared unruffled by the prospect of the coming round of layoffs, with some vowing loyalty to the vendor.

However, users were less than unanimous in declaring Wang's "Operation Customer" a success. In addition, statements contained in Miller's memo failed to reassure analysts, some of whom questioned whether Wang's recently regained toehold on profits and customer confidence can withstand the battering of recession and war.

Despite progress on product commitments, Wang "still has spotty and inconsistent quality in field organizations around the world," said Barbara Babcock, an analyst at Gartner Group, Inc., a Stamford, Conn.-based market research firm. Wang still has work to do, she said.

On a positive note

Jay A. Martus, an attorney and Wang user in Miami, said he has no complaints with the vendor. "They have been really terrific, especially the research and development staff," he said. Martus added that Wang is now sending consultants and systems analysts on sales calls, which he said makes a difference in the quality and accuracy of customer orders and installations.

Clem Kichuk, vice president at longtime Wang user site Marketcorp Systems, Inc. in Westport, Conn., backed Wang, saying, "Wang has awakened to the fact that you can't walk away from a lost sale without evaluating why the opportunity was lost."

However, David Wilson, vice president of data operations at Citizens National Bank in Evans City, Pa., took a dim view. "It's more and more difficult to get software support, particularly when it concerns the operating system," he said. "We had an operating system problem that caused our system to halt daily for seven months. There just weren't people available that knew how to fix it."

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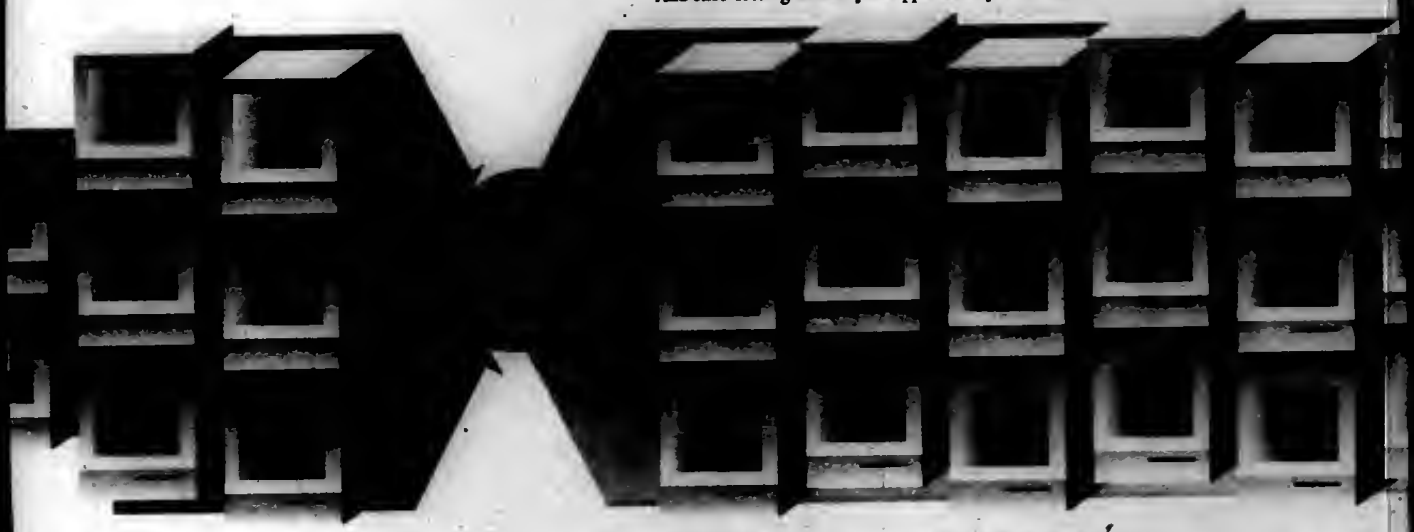

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Ashton-Tate Dbase appeal falls flat

BY JAMES DALY
CW STAFF

TORRANCE, Calif. — Ashton-Tate Corp.'s first attempt to reverse a court decision that stripped it of the copyright to its flagship Dbase product line fell flat last week when the federal judge who issued the initial ruling said he would not reconsider his verdict.

Ashton-Tate officials said they were "disappointed but not surprised" by U.S. District Judge Terrence J. Hatter Jr.'s refusal to reconsider his Dec. 13 ruling, which dismissed an infringement claim against Fox Software, Inc. The company said it would file a notice of appeal with the 9th Circuit Court of Appeals in Los Angeles. The appeals process typically takes approximately 18 months, an Ashton-Tate spokeswoman said.

In dismissing the 2-year-old case, Hatter ruled that when Ashton-Tate filed for its original Dbase copyright, it neglected to disclose that the program was a derivative of the Jet Propulsion Laboratories Document Information System (JPLDIS), a public-domain application developed at Jet Propulsion Laboratories in Pasadena, Calif.

Ashton-Tate President William Lyons claimed there was no deliberate intent to mislead the copyright office. Lyons also maintained that the copyright office would still have issued the application even if the JPLDIS had been mentioned.

Ashton-Tate officials claimed that as long as the case is being adjudicated, their products remain protected by license agreements under which users agree not to make copies except for backup purposes.

Separately, Ashton-Tate last week said it began shipping a version of Dbase IV for Sun Microsystems, Inc. computers that will sell for $995.

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Tandem adds to 800 series

BY JEAN S. BOZMAN
CW STAFF

CUPERTINO, Calif. — Tandem Computers, Inc. drove the performance of its midrange CLX computers 40% to 50% higher with the addition of a new high-end 800 series of CLX machines last week.

At the same time, the company added support for X.400 networks to its Unix computers and Tandem-proprietary Guardian systems, allowing the transfer of data, text and images.

The CLX 800 computers range from two to 16 processors and include from 32M to 512M bytes of main memory, said Richard Hellyer, product marketing manager for Tandem's systems products. New 1-micron CMOS chips are 40% to 50% more powerful than chips used in the 18-month-old CLX 700 series.

Some industry analysts said they believe Tandem is positioning the CLX for a long-range upgrade path, even at the expense of older VLX models.

"It looks like the CLX will definitely close in on the [price/performance of the] VLX machines, and it may come to be seen by users as a more strategic system," observed George Weiss, program director for midrange computers at Stamford, Conn.-based Gartner Group, Inc.

"Our upgrade from the CLX 700s was just a board swap," said John Howe, chief technical officer at Applied Communications, Inc., an Omaha banking systems integrator and a Tandem value-added reseller that was a beta-test site. "There was no need to regenerate the system, but we did have to shut it down for a few minutes to do the swap." Howe said the operating system automatically reformatted the address space to match the new memory size.

CLX 800s are priced from $125,000 to $965,000, depending on configuration.

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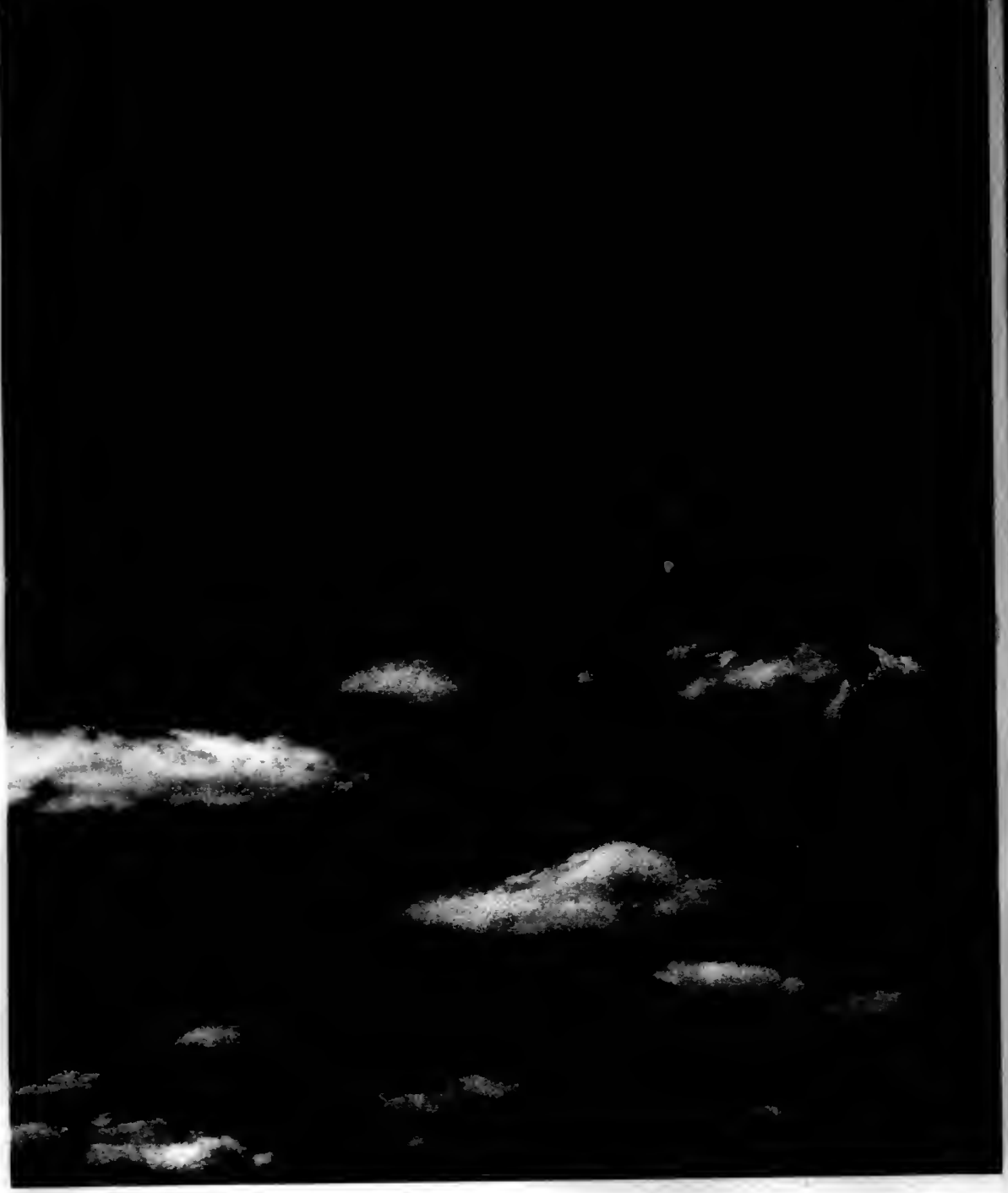

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HEWLETT PACKARD

VDT

FROM PAGE 1

and emphasize quality as well as quotas.

For example, Memphis-based Federal Express Corp. has a people-oriented VDT monitoring policy that is widely supported by the company's customer-service agents, according to studies by Alan F. Westin, a consultant and a professor at Columbia University in New York.

"Federal Express provides a practical model of adept and successful management of VDT use even in a cutthroat national and international competitive setting," Westin said.

However, firms known for their fair work-monitoring practices, such as Federal Express, IBM, Merck & Co. and American Express Co., seem to be in the minority, he said.

"It's a real mixed bag out there. Some companies do it very well, and some do it lousy," said Rebecca Grant, assistant professor of information systems at the University of Cincinnati and author of the forthcoming book, *Silicon Supervisors: Computer Monitoring in the Service Sector*.

Computer monitoring is widespread in businesses employing data-entry clerks, reservation agents, insurance claims processors and customer-service agents. Typically, the software for processing these transactions includes, as a by-product, monitoring utilities that compile statistics about each terminal hooked to the host computer.

Fear of monitoring

For example, many insurance companies are installing imaging systems that include "work-flow software." At ITT Hartford's claims office in Pittsburgh, workers initially feared Big Brother-style monitoring with the installation of a Wang Laboratories, Inc. imaging system, but "we assured them that it was an evaluation tool to be used for personal work-flow changes," said Robert R. Lukas, assistant vice president of information services.

United Services Automobile Association has more than 2,000 employees working on an IBM Imageplus system with electronic monitoring.

"Employees tell us they love it," said Charles A. Plesums, senior director of image technology. Before imaging, workers had to rummage through stacks of paper to sort and arrange assignments, but the work-flow software "produces one document at a time and decreases the feeling of being overwhelmed with work," he said.

The software produces more accurate measurements of performance and assures employees that "promotions and raises do come to those that are most productive," Plesums added.

Experts said employee reactions to computer monitoring are influenced by a variety of factors, including perceptions of how fair, accurate and appropriate the monitoring is.

Grant, who studied 1,500 employees in Canadian service firms, provided the following monitoring suggestions for management:

- Monitor only those important-but-routine tasks that can be quantified, and monitor them on a regular (rather than spotty) basis to fairly capture peaks and valleys in the work flow.
- During performance reviews, discuss the quality of the individual's work in addition to the productivity figures. Many supervisors are guilty of over-relying on the monitoring data.
- Employees should have a role in designing the monitoring program or have a thorough understanding of its design and use. They should be able to review the data and correct errors.

Some companies post individual performance data on bulletin boards, thinking this will motivate less-productive workers and reward higher producers. However, public displays are more likely to demoralize the laggards and prompt co-workers to ostracize the performance leaders, Grant said.

Hazardous to health

Besides being a morale issue, computer monitoring is also a health issue. Telephone operators subjected to electronic monitoring reported more stress and stress-related aches and pains, according to a study conducted by researcher Michael J. Smith for the Communications Workers of America.

"The reliance on electronic monitoring is almost forcing managers to manage poorly in terms of human relations. I question the assumption of managers that monitoring creates a more productive work force," said Smith, chairman of the industrial engineering department at the University of Wisconsin at Madison.

Grant cautioned that the issue of stress needs to be put in perspective. "People who are monitored are more stressed, but that is by no means the only cause of their stress. Some jobs are extremely stressful, and they just happen to be the kinds of jobs that are easier to monitor," she said.

Staff writer Sally Cusack contributed to this report.

When someone is watching

A 1990 survey of 762 VDT users at telephone companies indicated that electronic monitoring increased the level of stress and stress-related pain

(Percent reporting complaints)

Complaints	Monitored	Non-monitored
High tension	83%	67%
Exhaustion	79%	63%
Neck pain	66%	41%
Sore wrists	51%	39%

Source: University of Wisconsin at Madison and Communications Workers of America
CW Chart: Paul Moch

Monitoring malaise

Legislation to regulate electronic monitoring — which includes computer monitoring as well as monitoring of customer-service telephone calls — has been introduced in several states and in the U.S. Congress, but it has not come close to passage.

"Policymakers generally like to see if the marketplace or technology will solve the problem," commented Robert Ellis Smith, publisher of the "Privacy Journal" newsletter in Providence, R.I.

However, one of the biggest critics of electronic monitoring, the Communications Workers of America (CWA), hopes that situation will change as a result of new studies showing the adverse health effects of monitoring.

David E. LeGrande, the CWA's director of occupational safety and health, said that the recent CWA study of telephone operators, as well as a forthcoming study from the National Institute for Occupational Safety and Health, "will give us a lot more muscle in the legislative process."

LeGrande said he also hopes to generate some data showing that curbing electronic monitoring actually reduces a company's health care costs. "When we get good cost data, which shows the benefits of eliminating these archaic monitoring systems, then it will be an easy decision for legislators," he said.

MITCH BETTS

Virtue triumphs

Back in 1983, Federal Express developed a remarkably comprehensive agenda for its VDT work policies — one that a majority of U.S. firms have yet to embrace, according to Alan F. Westin, a consultant and professor at Columbia University. Issues on the agenda, ranging from ergonomics and stress reduction to electronic monitoring, were given high priority for implementation throughout the 1980s.

But there was a time in 1985 when the company's "people-first" philosophy was in jeopardy. In an effort to cut costs and boost efficiency, the manager of customer service in Memphis set out to reduce the "average handle time" for customer-service calls and decided to base 50% of each employee's performance rating on this point.

The result was an increase in employee discontent and stress-related health problems, Westin said. When the problem was reported to Chief Executive Fred Smith, he ordered corrective actions that included a new performance-evaluation system, developed with input from employees, that is weighted 80% toward quality service and only 20% on work statistics.

The moves restored employee morale and — "as though to prove that virtue sometimes triumphs" — the average handle time at the Memphis center dipped below the level sought by the more coercive program, Westin reported.

MITCH BETTS

DEC improves its image

BY ELLIS BOOKER
CW STAFF

PHOENIX — Digital Equipment Corp. took steps to raise its visibility in the document-imaging marketplace last week, introducing its first preconfigured imaging product.

Although DEC has had an architecture encompassing imaging since 1984 and software development tools for imaging since 1989, it did not have a commercial package to sell. The omission, analysts said, has put the company behind other computer companies such as Wang Laboratories, Inc. and Unisys Corp.

Meanwhile, DEC and two other vendors at the IDC/Avante conference last week used the occasion to announce support for Microsoft Corp.'s Windows 3.0 environment. Wang and Filenet Corp. said they will use Windows 3.0 as the interface on the desktop. DEC will support it through a third party.

Meanwhile, the few users at the meeting were repeatedly urged to view the big picture and consider imaging applications as part of a department- or companywide flow of information. The future, speakers said, belongs not to imaging per se but to the work-flow software that will control its processing.

Targeting the midsize department of five to 20 users, Decimage Express can use either the VAX or the DEC Ultrix Unix platform as a server. DEC will use the Plexus XDP software from Recognition Equipment, Inc. to run on Ultrix. For the client, Express can use a variety of workstations and terminals under the Decwindows interface.

The Decimage Express software license is $5,000 per concurrent user.

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IBM, HP to support Transarc

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — IBM, Hewlett-Packard Co. and other vendors said last week they will adopt a start-up firm's distributed transaction processing monitor throughout much of their product lines. However, the computer companies said, actual implementations of the monitor are about two years away.

The as-yet-unnamed monitor is based on the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) and is being developed by Transarc Corp. in Pittsburgh. The monitor will allow proprietary and Unix-based computers to run distributed, transaction-intensive applications, according to Transarc.

Besides IBM and HP, other Transarc backers include Stratus Computer, Inc., Informix Software, Inc., Ingres Corp., Independence Technologies, Inc. and JYACC, Inc. Also, Digital Equipment Corp. is "in negotiations" to use at least a portion of the technology, Transarc President Alfred Z. Spector said.

John Rymer, senior consultant at Patricia Seybold's Office Computing Group in Boston, said Transarc's product could make developing distributed on-line transaction processing (OLTP) applications easier and less expensive for both users and vendors because the base technology would already be in place.

"Today, much of this work is custom, and this [announcement] could lead to more generally available distributed OLTP software," Rymer added.

However, this scenario is at least a couple of years away from becoming a reality. Transarc is not shipping its monitor technology commercially yet. One reason is that it requires DCE, and the OSF is not scheduled to ship that until June.

IBM will incorporate the Transarc scheme into its proprietary systems and its Unix-based products, said Mike Saranga, assistant general manager of systems structure and management at IBM's Programming Systems Group. "We view the DCE and Transarc services as an excellent base for future AIX on-line transaction processing software," he said.

Stratus and HP will also incorporate the Transarc monitor into their systems. In HP's case, it is expected to appear on both the 9000 and 3000 series systems within approximately two years.

At the heart of the monitor technology are three core elements: a transactional remote procedure call, which allows different computers to communicate; a distributed transaction service to coordinate multiple networked servers; and Transactional C, to provide interfaces for programmers.

"I HAVE TO FREE $750,000 FROM MY DATA CENTER BUDGET NOW..."

A USER'S CHALLENGE:

The director of computer operations at one of the nation's best-known on-line service companies had a serious problem last Fall. He had production-crippling paging problems, degrading response times on 1,000 3270 PCs, and a mandate to update five mainstream applications. He had enough budget to upgrade his System/3090 Model 200 to a 300E, but was still $750,000 short of his needs. His quick solution: STOR/9000 central and expanded memory from Cambex. He replaced and doubled original memory with Cambex STOR/9000 memory and had his answers: no paging problems; 3270s that fly; development going full blast. Once it's installed, users don't think about Cambex memory. They only think about the opportunities it gives them. Ask your Cambex sales representative for more information about this customer.

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Focus/EIS to target desktop

BY CAROL HILDEBRAND
CW STAFF

In a move that analysts predicted would shore up weaknesses in each component, Pilot Executive Software and Information Builders, Inc. unveiled plans last week to bundle key products to create Focus/EIS for Windows.

The package is made up of Lightship, Pilot's Microsoft Corp. Windows 3.0-based executive information system (EIS) for personal computers and local-area networks as well as a dynamic data exchange that links the system to PC/Focus, Information Builders' application development and decision support system.

Mainframe-based databases such as IBM DB2 and Information Builders' mainframe-based Focus can be transparently accessed as well, the companies said.

A perfect match

"I think it's a really nice marriage of products," said Ronni Marshak, editor in chief of the "Office Computing Report" at Patricia Seybold's Office Computing Group. "It gives Focus the front end that's easy to use and works on the Windows desktop, and it gives Lightship users access to multiple databases with a single product."

Users can use hot buttons and drill-down capabilities to access more detailed layers of data across multiple databases, a function that Bryce Segar at Infinity Data, Inc., a consultancy in San Antonio, said would add to the intelligence of the data. "It was something we couldn't do in Focus before," he said.

One weakness of the product is a lack of analytical abilities, according to analysts. "Lightship doesn't [give] full decision support," Marshak said. "The artificial intelligence aspects aren't there."

Focus/EIS could also present competitive problems for Pilot, said Cliff Conneighton, an analyst at Gartner Group, Inc. who predicted Focus/EIS for Windows would bump sales from Command Center, Pilot's mainframe-based EIS.

However, Marshak disagreed, saying that Command Center is targeted at a more traditional executive base and that as executives become more comfortable with technology, the need for such structured, preplanned systems would fade.

The companies said that Focus/EIS is scheduled for availability in late February and will sell for $895.

ADVANCED TECHNOLOGY

TECH TALK

It's Nice for Sequent

■ Sequent Computer Systems, Inc., in Beaverton, Ore., said recently that it plans to open a European development center this month in Sophia Antipolis, near Nice, France. The new center will initially focus on developing and distributing open systems-based communications software for the company's Symmetry series of computers. Later, the center will develop object-oriented database application software designed for a multilingual customer base.

Smart forms software

■ Researchers at Bellcore in Morris Township, N.J., have developed experimental software designed to automate the entire process of handling business forms: selecting the appropriate form, filling it out, routing it for approvals and even signing the form. Superforms, as the new software is called, uses scanning and image-processing techniques to recreate realistic blank electronic forms from paper copies. Electronically produced forms are more efficient than paper forms, the researchers said. The software uses encryption techniques to ensure that forms or parts of forms are seen only by authorized users. Users can be given tamper-resistant smart cards that contain the keys for encryption and authentication and that can also be used to sign the card with a forgery-proof digital signature.

Super chip

■ Xsirius Superconductivity, Inc., a superconductivity microchip manufacturer in Scottsdale, Ariz., said it is testing a superconducting microchip designed to boost the power of radars and other ultra-high-frequency microwave devices from 10 to 100 times their normal capacity. The chip "will probably first be used in U.S. military applications such as radar-based telecommunications systems," said Christine Barksdale, Xsirius' vice president of operations.

An inside view of neural technology

Still in their infancy, humanlike networks may soon provide practical applications

BY MICHAEL ALEXANDER
CW STAFF

See if you can spot a pattern in the following three examples.

- Scientists at the University of Toronto are working on a computer that can translate the movements of a gloved hand into speech. The project, called "Glove Talk," may one day enable those with hearing or speech impairments to communicate using a voice synthesizer.
- Scientists at the Oregon Graduate Institute of Science & Technology are giving a computer a course in the linguistic structure of speech. The English Alphabet Recognizer is a step toward teaching a computer to understand human speech.
- Scientists at Sandia National Laboratories are developing a computer that is able to pick out a target in a video image. In addition, the computer could eventually be used to pinpoint incoming missiles and help guide a counteroffensive.

The pattern? Scientists are working on applications that one day could enable computers to take on more humanlike qualities. What is less obvious is that all of the above applications are based on neural networks, a technology that imitates the human brain's ability to sort out patterns and learn from trial and error.

The brain v. the computer

A neural network is an information processing system that is modeled after the human brain's interconnected system of electrically activated neurons. The human brain's neurons — there are billions — are either on or off, and to that extent, they follow the binary logic of computers. One key difference is that a conventional computer works on a problem in sequence, one step at a time. The brain, in comparison, contains an intricate web of neurons able to divvy up a task and work on it simultaneously.

There are perhaps as many as 300 applications of neural network technology under development, ranging from neural computers adept at predicting the direction of the stock market to airport sniffers that are able to detect explosives, according to Tom Schwartz, president of The Schwartz Associates, a consulting firm in Mountain View, Calif., that specializes in neural networking. Schwartz predicted that the neural networking market, including systems and services, will exceed $1 billion by 1995.

Other experts are not so optimistic, however. The technology is still in its infancy, and large-scale commercial applications remain at least five years away from being put to use, according to some observers.

"It is a low period for neural net technology," said John Gilmore, who heads the artificial intelligence branch of the computer science information technology laboratory at the Georgia Institute of Technology in Atlanta. Funding from the U.S. government, the primary backer of research for neural networks, has dried up, and the work that continues has little real-world application, he said.

"A lot of people in the industry thought the application was ripe to solve real problems, but it is far too premature [to start deploying neural networks]," Gilmore said.

One problem with existing neural networks is that they have too few neurons and are thus unable to learn rapidly or respond quickly enough to be useful in most business settings. The experts believe that a practical neural computer requires a network of at least 1,000 interconnected neurons.

It is tempting to compare neural networks to human thought processes, but the comparison is "incredibly misleading," Schwartz said. "The neurons in the brain are doing hundreds of functions, while those in neural networks are doing three or four functions at the most."

Over the past year or so, several firms have either introduced or have announced plans to develop neural networking chips that promise to overcome learning and response obstacles.

Neural networks need chips on the table

"When enough people think technology is interesting, they start doing chips," said Tom Schwartz, president of The Schwartz Associates, a Mountain View, Calif. consulting firm that follows neural networking.

Although neural networks are still five years away from being used in a big way, some experts said, the race to develop neural networking chips is already on. During the past year or so, about a dozen companies, including Intel Corp., Adaptive Solutions, Inc. and Science Applications International Corp. have introduced neural networking chips or announced plans to develop them.

Though the first neural-network chip was introduced in early 1989, a commercial market for the chips is "still only a vague shape on the horizon," Schwartz said.

Work on neural networking chips is being fueled by a need to develop networks that are capable of learning and responding faster than is now possible, Schwartz said.

The majority of neural networks under development today are capable of executing 10 to 20 million connections per second. At that rate, it often takes several hours for a network to respond. For the technology to be practical, it must be able to execute at 2 billion connections per second or more, according to the experts.

Researchers at Sandia National Laboratories have developed a target-recognition system that runs at 2½ billion connections per second and can pick out a target from a digitized video image in four seconds — still too slow if the target is an incoming missile, however. The system will need to process 1 trillion connections per second.

MICHAEL ALEXANDER

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EDITORIAL

Is bigger better?

PERHAPS NO OTHER industry in history was born, grew so fast and then consolidated itself as quickly as the software industry.

From the time the federal courts ordered IBM to unbundle software from its turnkey systems in the 1960s, companies sprouted like buds in spring, grew at supersonic speed while their founders became instant paper millionaires and then began withering ever so quickly to the point at which many became easy takeover targets.

While this mayfly life span has been primarily confined to the large systems software companies, the driving forces behind the rapid evolution of today's large systems software market are really no different from those in the personal computer market, according to one who should know.

On the opposite page, Computer Associates Chairman Charles Wang draws a compelling sketch of an industry drawn into consolidation by the need to provide integrated software solutions to satisfy today's customer — apart from the one-shot wonders of just a few years ago.

Does his model apply to the PC vendors as well? Consider the tremendous difficulty encountered by the leading PC companies such as Lotus, Microsoft and Ashton-Tate in bringing more broadly integrated products such as the current versions of 1-2-3, Windows and Dbase to market. Were it not for their sheer size relative to their smaller competitors, their success surely would be in doubt.

And note that although Wang authored this accompanying piece, it could have been written just as easily by the brain trust at D&B Software or Legent, which have also grown quickly via the acquisition route.

The benefit of consolidation to the customer, they would each say, is in their disposition toward producing software that is increasingly platform-independent as well as integrated in form and function with their own and other vendors' applications and network offerings. The smaller companies, the argument continues, have had their day in the sun, and their innovative panaceas more often than not are incompatible with market demands.

To a great extent, the forces of consolidation and bigness are inexorable in the software industry. Is that good for the customer? Ask yourself this: Did the customer benefit from the aforementioned instantaneous competition to the IBM software near-monopoly in the 1960s? Didn't IBM, in fact, argue the merits of its prodigious size and how it relates to the customer?

The answer to the question of size and competition lies somewhere between quasi-monopoly and completely free and open competition. As long as customers cast their dollar votes freely, it's our guess there will be plenty of room for companies of all sizes producing a very broad menu of product offerings, with the benefits of companies both very big and not-so big improving the marketplace as well as keeping one another honest.

LETTERS TO THE EDITOR

Poorly charted

The chart on page 98 of the Dec. 17 issue of *Computerworld* is obviously intended to be a satirical demonstration of "chart-junk."

With sly humor, your artist takes pie charts, which are not very rich in information to begin with, and shows how to make them even poorer. Each row shows three percentages of the same total — which traditionally would be shown as three wedges of a single pie. By giving each individual percentage its very own pie, you achieve a staggering threefold data dilution.

Visual comparison is impeded by skillful use of clutter (little gray buckets, funny cigar-shaped lines and triple blue railroad tracks); by having color increase as percentage numbers decrease; and by subtle variations in the orientation of the wedges. Glance at the purple wedges next to "system engineering" and "OSI support." Quick — which was rated as more important?

Next year, use ray-tracing software to render those ornaments as round and shiny. Give each ornament multiple reflections of checkerboards, surrounding ornaments and teapots. Put it all on a graduated background shading from red to green. Give us a chart that is truly dazzling ("dazzle: to dim the vision, to blind with intense light, to bewilder").

Daniel P. B. Smith
Norwood, Mass.

Dialing for dollars

I would like to join NASA in refuting the *Houston Chronicle* article that claimed NASA lost $12 million from fraud on its private branch exchange (PBX) [CW, Dec. 10].

The reported "facts" — and especially the loss figures — did not come from me. I repeatedly told the writer that I could not give "average" losses in PBX fraud cases because the size of the loss varies with factors such as the configuration of the system, the nature of its outdial capability, whether it permits international calls, the type of security and audit trails in place and even the identity of the long-distance carrier. While we did discuss several recent cases of corporate and government PBXs being compromised, I also pointed out that the Federal Telephone System does not bill like standard commercial service.

When the writer called, I told him I had no knowledge of the NASA incident, agreed to help him with background material on PBX fraud in general and referred him to other sources. When I saw the article, I was shocked by its inaccuracy. Nothing in it bore any resemblance to my "background" conversation with the writer.

Gail Thackery
Assistant Attorney General
Organized Crime and Racketeering Division
State of Arizona
Phoenix

For the records

I recently read an article titled "Chief publishing officer to the rescue" [CW, Oct. 22, 1990].

I do not want this reply to sound like a reprimand, but it struck me as to the number of ill-informed people there must be when it comes to information management.

In the article, the writer makes a point that information services and the printing facilities are at different ends of the spectrum, and a new position should be created to regulate information and documents in the organization called the "chief publishing officer."

To start with, the IS and printing facilities are not at separate ends of the spectrum. They are at the same end, and that end is the creation end of information and documents.

Where the author and others miss the boat is by not looking in their own organization for an existing position. In most organizations, there is already a position that controls, regulates and has a good understanding of the entire spectrum of information/document management, and this position is the records information manager.

The records manager of today is a skilled professional who has an extremely broad spectrum of knowledge so that he or she can make intelligent decisions in the company's document flow to protect its assets and memory.

Carl J. Elsbree
Manager, Operations
Records Management Services
Xerox Corp.
Rochester, N.Y.

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No software solution is an island

CHARLES B. WANG

Since its creation in the late 1960s, the independent software industry has grown into a likely candidate for the most dynamic and enterprising industry of its time. A rapid succession of software breakthroughs has propelled the sophistication of automated information processing. Over the years, however, isolated software solutions have opened a Pandora's Box of incompatibility that must be sealed if information processing is to deliver salvation to the business marketplace in the 1990s.

The "one-off" solutions of yesterday originated in response to a number of factors: the requirements of the single hardware platform environments of the past, individual needs identified by end users and data processing professionals and the vendors' need to carve out identities for themselves.

In addition to niche solutions developed by vendors, users developed systems to address unique needs, adding to a myriad of data processing configurations and software solutions.

Guided by these sources, the computer software industry is driven by "breakthrough" technologies designed to address an ever-changing procession of new business problems. Many of these "breakthroughs," however, were mistakenly presented as panaceas, positioned as replacements for widely implemented technologies without regard to the money already invested by user organizations.

In the 1970s, for example, it was predicted that fourth-generation languages would replace all Cobol-based applications. Other examples of "panaces" technologies include relational and object-oriented databases.

As history has demonstrated time and time again, breakthrough technologies, while clearly beneficial, have only limited utility unless they can be integrated with existing solutions.

Integrated solutions

No longer can businesses succeed with detached solutions intended to solve isolated problems. A single application that offers a solution to a single problem carries with it a world of new challenges in today's complex networked systems. We must consider the ways in which businesses actually process information to assist them in achieving the most benefit from existing technology while taking advantage of new technologies.

In an atmosphere of such rapid change, the software industry is obligated to integrate isolated islands into cohesive solutions to better serve business.

The demands of the user community have undeniably become more sophisticated. Vendors are beginning to address their real-world needs, acknowledging the necessity of providing total solutions that offer ease of use. To this end, many software vendors have aligned themselves with others to deliver more complete solutions. For example, applications suppliers are seeking alliances with vendors who can provide graphical user interfaces to front-end their systems for more "user-friendly" interaction.

Beyond these alliances, we have witnessed consolidation within the software industry because niche vendors simply cannot provide the required integrated solutions.

Some believe that consolidation is bad for the user and that software vendors possessing a wealth of technology merely function as so-called "software supermarkets," housing a mass of isolated products. On the contrary, consolidation does not lead to supermarkets; it resolves the existing product hodgepodge. It creates vendors with a technology base from which to develop integrated solutions for today and tomorrow. In reality, it is the small, single-product software vendors that fall increasingly short in providing comprehensive solutions.

Bob Dalton

Not surprisingly, development of integrated solutions has begun with the hardware vendors; they possess more software than any independent software vendor. And fortunately, these suppliers are following carefully designed frameworks and industry standards to develop solutions that bring some order to today's chaos.

Software architectures such as IBM's Systems Application Architecture and Digital Equipment Corp.'s Network Applications Support as frameworks for software development are important for joining technology islands and furthering the standardization of software.

Taking the lead

Building on the hardware vendors' initiatives, independent software suppliers must now take a leading role and bring the critical aspect of platform independence to the development of software solutions.

Business software solutions have been and always will be developed through an evolutionary process. Today we are witnessing a rapid reduction in the number of software vendors that sell only one-off products. In equal measure, we are experiencing a rise in the number of technology suppliers that are striving to deliver true integration across hardware platforms.

The companies working to provide these solutions through alliances, acquisitions and internal development are not creating software holding companies. Instead, they are establishing treasure chests of technology that will enable user organizations to develop cost-effective, strategic business/technology plans that will support their operations today and, as importantly, adapt to tomorrow's requirements.

Wang is chairman and chief executive officer of Computer Associates International, Inc. in Garden City, N.Y.

Recession offers chance for IS groups to triumph

PAUL BERGER

All signs indicate that the U.S. is in a recession. Layoffs, cutbacks and bankruptcies are increasing.

Although the economic indicators look bad, this business situation presents opportunities for information systems management. By taking the lead in the application of technology, an IS department can help its company do more than just weather the downturn: it can help the company come out of the recession in a stronger, more competitive position.

It has been demonstrated many times that successful companies use recessions to correct problems and reposition themselves for the forthcoming upturn in business. They move aggressively into new business areas.

This time, technology will be an important means of accomplishing the repositioning. Restructured and trimmer organizations depend more on technology than did their bloated predecessors. Cutting out layers of management may have been initiated as an economic measure, but quicker, more flexible and better-informed organizations make more responsive companies. In today's environment, that spells success.

True, IS departments are affected by the turndown in the economy. Head-count growth stops, and layoffs occur. Travel and training are curtailed. New acquisitions of equipment are slowed. Investment in new projects and infrastructure is delayed. However, this is not the time for IS to dive for the foxholes. The budget cuts can be turned around if IS demonstrates its ability to join in the restructuring and use technology to help make it work.

There are seven areas of opportunity for IS. They are: technology leadership, quality, networks, customer focus, new products and services, cost control and electronic data interchange (EDI).

- **Technology leadership.** During the late 1970s and the 1980s, IS managers attempted to overcome their "techie" image by downplaying their technical skills and emphasizing business and people skills. As a result, many corporate managers no longer consider their IS departments as sources of technical expertise. They look to vendors and consultants for this resource. The IS department has to re-establish its technical credibility.
- **Quality.** The IS department can participate in a company's quality program in two ways: supplying technology assistance to help other departments with their quality programs and implementing a quality program within the IS organization.
- **Networks.** The IS department should take the initiative to build this important part of the infrastructure that provides the telecommunications network capabilities required to run a modern company. To do this requires technical and business skills.
- **Customer focus.** Contemporary company management recognizes that the use of computers and telecommunications to support and service a company's relationship with its customers is essential. This covers a range of areas in which IS leadership and participation is essential, including development of integrated customer relationship databases, provision of on-line customer access to files and market analysis.
- **New products and services.** The opportunities for a company to use information technology to produce new products and services vary greatly from industry to industry. For example, companies in the service industry have an easier job of integrating technology into their product offerings. However, manufacturing firms and retailers can also be very creative in their use of technology to provide revenue-generating service offerings.
- **Cost control.** This is a more traditional area for IS activity, and there is still much to be done here — especially in the current business environment. Automating labor-intensive tasks and providing accurate and timely cost and expense data are time-honored pursuits that still need attention. Using technology to improve inventory, procurement and material control in a "just-in-time" implementation has payoffs in reducing material costs and increasing margins.
- **EDI.** There is much to be gained in the broad application of EDI for intracompany and intercompany communications. The broad application of EDI goes beyond procurement and purchasing to include provision of a full electronic highway for document exchange in all kinds of business transactions.

Now is the time for real and substantive returns on the investment of the last few decades. IS departments have to take action and seize the opportunities, putting their own houses in order and becoming full participants in business change.

The recession of 1990-1991 can be the door opener. If IS doesn't walk through that door, others will.

Berger is a consultant, writer and video producer devoted to the business use of information technology. His office is located in Lawrenceville, N.J.

"My ultimate PC system? Well, for starters, it's got to be compatible with everything I've got already...so you can take a floppy from an old PC, pop it into a new one, and it will work."

"Networking PCs is a major pain. I'd like to see PCs designed to do networking without lots of configuration work...and still connect with all the networks I've already installed."

"We've got plenty of data... the challenge is to put it in the hands of decision makers in a form they can use. The perfect PC would be an ideal client to all my information systems."

"Every time I turn around, vendors change the operating system or interface. I want to be able to drop the hottest new box on my executives' desks and know their software will run."

Hidden camera reveals the se

Not long ago, we invited hundreds of IS managers to talk about their wildest desires in a personal computer system.

They talked. We listened. We videotaped. And when we got those tapes back to Silicon Valley, popped them in the VCR and started watching, it confirmed what we knew all along.

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"A graphical interface is clearly important... users love 'em. But the architecture has to be designed to handle it or the performance compromise is unacceptable."

"I'd like to see more discipline from software developers. Commands should be consistent for every application... it would eliminate the cost of constantly retraining."

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"Macintosh? No kidding?"

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Wang faces the need to serve two masters

Must deal with VS users while going 'open'

ANALYSIS

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Like several of its counterparts, a financially troubled Wang Laboratories, Inc., having once amassed large profits in the now dying proprietary midrange market, must satisfy its sizable midrange client base while simultaneously re-engineering products to comply with open systems concepts.

However, the computer vendor may have a bigger-than-average window to work in during the transition, providing it can keep its VS customers happy.

According to Matt Gillman, president of the U.S. Society of Wang Users, most VS users are not looking to move to open architecture platforms in the immediate future.

Wang launched its line of VS minicomputers and superminis in 1977, and according to David Eulitt, an industry analyst at Computer Intelligence, a La Jolla, Calif.-based market research firm, Wang had a total of 18,655 VS installations worldwide as of July 1990.

While Gillman said he expects most VS users will have to move to open systems in the long run, he said they seem to be satisfied with the VS product line's open architecture.

Major change for mini

Wang announced its initial open systems/server strategy in December 1989, saying it would reposition the minicomputer as an application server while maintaining its role as a mini in traditional business data processing environments.

According to the company, the open systems/server products will include a family of industry-standard systems based on Intel Corp. microprocessors and will offer applications that are binary-compatible, from personal computers to larger, multiprocessing computers.

"Wang will look out for VS user concerns," said Thomas H. Willmott, vice president at Aberdeen Group, a Boston-based market research and consulting firm. "Its core business activity revolves around its VS customers, and the transitions will be gradual over the next few years."

Willmott noted that it is currently a tough selling climate for proprietary midrange vendors, all of which are facing heavy competition from Digital Equipment Corp. and IBM.

However, he said, the VS has taken Wang through the calendar year of 1990 with a decent stream of revenue, and in its own best interest, the company will continue to see to the care and feeding of its installed base through price/performance packages, upgrades, applications and services.

Most analysts seemed to agree that the bulk of Wang's recent VS sales is in its installed base. However, analysts said they do see some movement of the VS 5000 into new accounts with imaging-based applications.

It is no secret that Wang hopes to achieve success in targeted vertical markets, such as law, finance and insurance, by providing value-added services with its suite of imaging application products — once again positioning the VS as a server.

Robert Lukas, assistant vice president of information services at ITT Hartford in Connecticut, currently has 52 VS 8000s installed in the company's branch offices nationwide and is also piloting an imaging project on Wang's VS7160 platform.

> "PROBABLY THE BIGGEST concern in the VS community right now is waiting for the new release of the Wang operating system."
>
> MATT GILLMAN
> SOCIETY OF WANG USERS

If The Hartford elects to go with the Wang system, it will automate all of the insurance firm's property and casualty claims processing functions.

While Lukas is enthusiastic thus far about the imaging project in the Wang environment, he indicated that it is important that a proprietary product should not restrict The Hartford from exploring and implementing other cost-effective opportunities in the market.

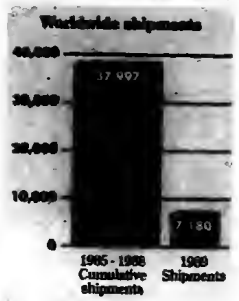
Lukas added that he feels the Wang VS is becoming as "open architectured [as] anything else that is currently advertised as 'open architecture.'"

"Probably the biggest concern in the VS community right now is waiting for the new release of the Wang operating system, which will double the num-

Continued on page 33

Opportunity

Wang's product line may be in transition, but there are still enough VS sites to hold the vendor's interest



Source: Dataquest, Inc.
CW Chart: Doreen St. John

Chicago schools get Inform-ed

ON SITE

BY ELLIS BOOKER
CW STAFF

CHICAGO — Situated on the city's depressed Southwest side, the gigantic former armory that houses the administrative headquarters of the Chicago Public Schools has been an embattled target for years.

Some have called this city's urban educational system the worst in the nation: a bureaucracy too unwieldy to serve the needs of its 430,000 students.

However, optimism about Chicago's schools can be genuine. Just ask Clifford E. Cox.

As assistant superintendent of MIS — essentially, the school system's chief information officer — Cox has spent the past several years expanding the reach of his organization beyond the scope of traditional, back-office data processing.

"Ten years ago, there was tremendous emphasis on basic financial reporting," said Cox, who came to the system a decade ago from Arthur Andersen & Co., where he was a senior manager. Before that, he was a senior systems engineer at IBM.

Getting the financial and accounting systems in order was a top priority. The school system is a big business, with a budget of $2.5 billion, employing 40,000 people and running 600 schools. "But it seemed to me that key to any business is looking after clients or customers," Cox said. "And we had very little information on our students."

Cox says *he would like to see terminals in all the Chicago schools*

So Cox assembled a programming team, hiring teachers — not computer professionals — to develop a new application.

The result was the Comprehensive Student Information system (CSI), a centralized, online student database.

Originally run on a Unisys Corp. 11/94 mainframe, the CSI application grew and was moved to a larger 2200/622 mainframe last summer.

The system's database holds each child's record until he turns 21. The file then goes to tape storage, where it must be maintained until the individual reaches age 65.

Built in Mapper, Unisys'

Continued on page 33

On a steep learning curve with DB2? Or have you resorted to a 3GL to get the functionality needed with DB2?

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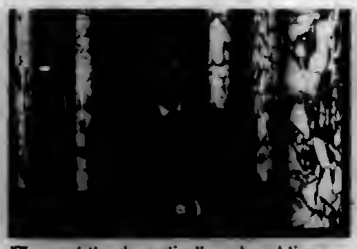
Senior Programmer/Analyst
Huntington National Bank



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"The strengths of the IEF are clear-cut. One obvious quality advantage is that application changes are made to diagrams, not code. This ensures ongoing integrity —the specification always matches the executing system."

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Chief Technology Officer
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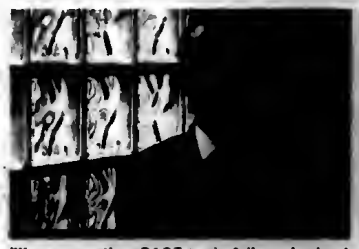

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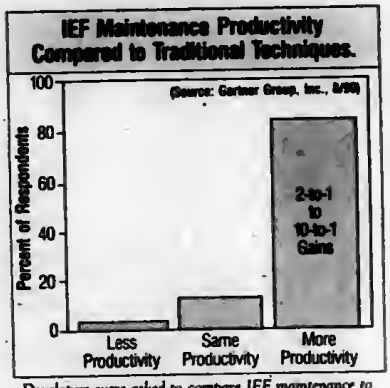
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) *IEF developers reported zero defects—not one abend had occurred in IEF-generated code.*

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

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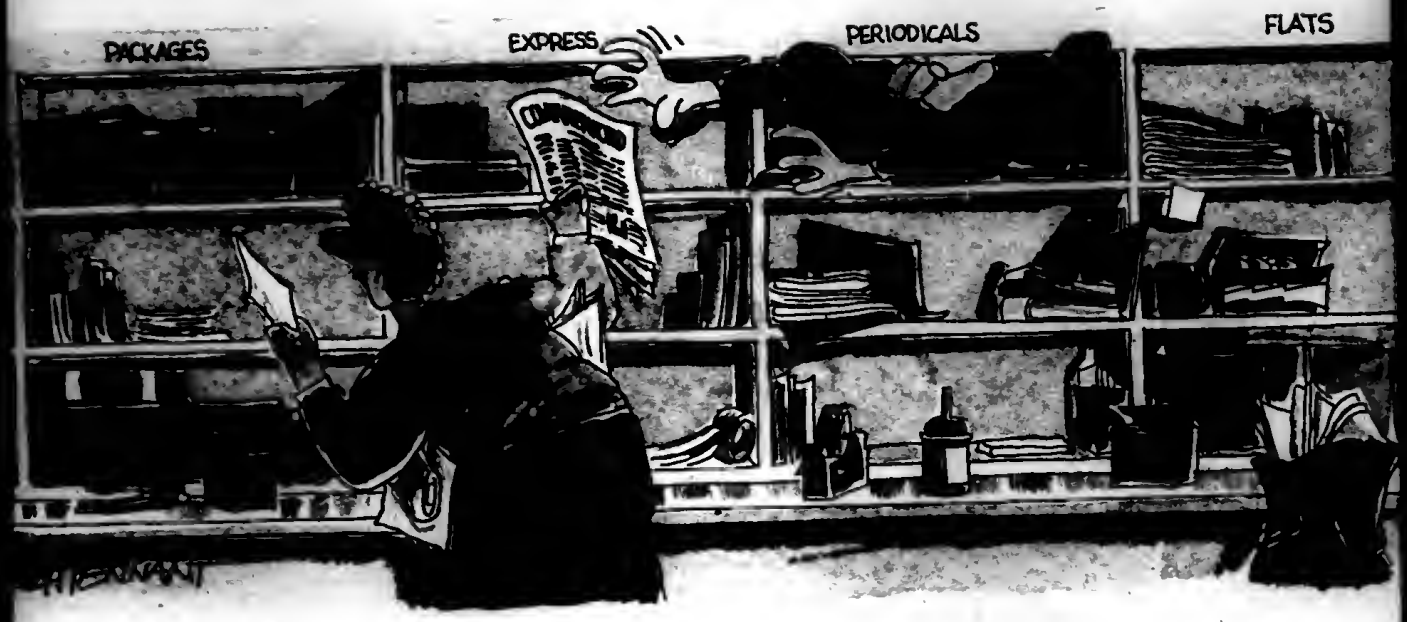

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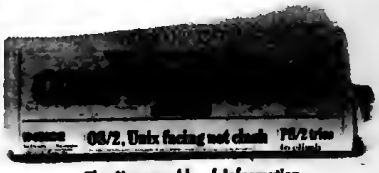

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University erases tape from computer center

ON SITE

BY ROSEMARY HAMILTON
CW STAFF

Having more than one year without conventional tape behind it, Boston University's administrative computing center is working to convert other departments and outside service providers to its no-tape philosophy.

The decision to stop using conventional tape as a primary storage medium was one aspect of the computing center's bigger plan for unattended operations, which began three years ago, according to Howard Miller, assistant vice president of university information systems.

Miller said he wanted to rid the center of reel-to-reel and cartridge drives because they have hidden costs, are often inefficient for accessing historical data and require too much human intervention.

He set out to find a replacement for traditional tape and considered optical storage as well as additional direct-access storage devices (DASD). But a mass-storage device from Masstor Systems Corp. in Santa Clara, Calif., won out in terms of performance and cost. The computing center brought in two mass-storage devices to replace a 16,000-unit tape library.

Plenty of storage space

The Masstor units provide online storage of multiple gigabytes of data on a single storage device. The technique behind these devices uses tiny, bullet-shaped tape cartridges that hold much larger volumes of data through data compression and other alternative storage techniques. The Boston University units hold 220G bytes and 440G bytes each.

Miller said he hopes to extend his no-conventional-tape plans beyond the administrative center to other segments of the university, which has various small systems running in autonomous departments.

Eventually, he would like these systems to upload data to the mainframe, which could then back up and archive historical data on the mass-storage devices.

The trick, however, will be to figure out a way to allow the mix of systems, including several Unix variations, to communicate with the IBM mainframe.

Boston University's Miller *is espousing a no-tape philosophy*

Meanwhile, Miller is also working with outside service providers, including banks and software vendors, to move beyond the tape mentality. He said he negotiated with one bank to provide the university with electronic updates instead of sending paper or tape each month.

"This is a lot like electronic data interchange," Miller said. "There hasn't been a lot of incentive to exercise this. You can imagine that if you were receiving hundreds of tapes that there's a tremendous effort to handle it."

He said the idea of eliminating all tape drives was considered radical by both staffers and observers outside of the university. "Even here, this is not fully accepted," he said. "DP people are as resistant to change as anyone else. They are comfortable with tape. They've made large investments in education to be that comfortable with it."

However, Miller said that the benefits from the switch outweigh any discomfort with the change. The computing center eliminated six jobs once the tape drives were removed. The mass-storage devices also brought an unexpected DASD savings. Previously, it was impossible to keep up with the data-archiving task because it was time-consuming to load data onto tapes. Data would often stay on the DASD long after it should have been archived. The new devices presented an easier and less manual way of moving data off the DASD.

When Miller's team completed all the archiving, it discovered 11G bytes of extra DASD space. This windfall was used as last year's DASD upgrade instead of purchasing more disk capacity, Miller said.

A third benefit was the center's electronic vault, located one mile away from the center and connected via a fiber-optic cable. Miller's team now backs up data and electronically sends it to the off-site backup unit. It has its own hot site, which contains a 440G-byte storage unit.

Sybase makes New Year's resolutions

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Sybase, Inc. executives said recently that they plan to refresh their company's product line in 1991, revamping the 1-year-old Release 4.0 of the SQL Server database engine with two new releases. The company, which claims 2,300 user sites worldwide, also pledged to resolve ongoing customer complaints over support issues and product delays.

Mark Pine, Sybase's newly named vice president of engineering, said the aggressive product plans account for beta-testing periods of several months each. "You can base your business decisions on these [product] commitments and not feel you're making a mistake," Pine told the 600-plus users who were gathered for the annual user conference earlier this month.

Last year, a number of products, including enhancements for Sybase's SQL Server for OS/2, were delayed by lengthened development times.

While many users said they are happy with Sybase's product plans, they reported problems with the firm's technical support services. "Sometimes you get good support, and sometimes it feels like you're talking to a high-school student," one U.S. Department of Defense software manager said. "The intent to fix the problem is there, but sometimes the capability is not." Sybase promised its users that such problems would be corrected in 1991 and that new support services would be added to improve response time.

Sybase Chief Executive Officer Mark Hoffman also assured users that new products would be shipped in a "timely" fashion, without the delays that have slowed updates to previous products, including the SQL Server for OS/2.

Sybase's Hoffman promises new products without delays

The current version of SQL Server for OS/2, which is resold by Microsoft Corp. and its distributors, is based on the older Sybase Release 3.2 database engine. Sybase wants to port new code to the OS/2 SQL Server in an attempt to make it fully compatible with Sybase's 32-bit Release 4.0. But Sybase managers said that effort has been delayed as they wait for IBM and Microsoft to agree on a 32-bit hardware platform.

Among the products Pine said would be shipped to beta-test sites in 1991 are the following:

- Sybase Release 4.8, a new version that supports symmetrical multiprocessing on servers such as the multiprocessor Stratus Computer, Inc. and Pyramid Technology Corp. computers. It will be shipped to beta-test sites during the first quarter.
- Sybase Release 5.0, which will supersede 4.8 and include all of 4.8's features, is expected to be delivered to beta-test users during the fourth quarter. Release 5.0 will support as many as eight languages, including Japanese, Korean and German.
- The SQL Toolset 5.0 will be shipped to beta-test sites during the third quarter. It will include enhanced software tools and better support for graphical user interfaces. Because Release 5.0 is not scheduled to be shipped until late 1991, an interim version with some graphical user interface support, Release 4.2, will be shipped to users during the second quarter.
- Release 2.0 of the Sybase Open Server, a product that was announced last fall, is also planned for introduction during the third quarter. The Open Server connects workstation and personal computer "clients" in Sybase's client/server architecture with Unix and Digital Equipment Corp. VAX hosts in Open Systems Interconnect networks. Even more important for large users, the Open Server links Sybase products with IBM mainframes running the DB2 relational database in Systems Network Architecture networks.

Although industry analysts reported that Sybase had an unprofitable first quarter last year, the company's business has continued to grow quickly. Analysts said Sybase was able to increase sales from $57 million to more than $100 million because the firm is riding an industry tide toward downsizing mainframe applications for use on less expensive minicomputers and PC-based local-area networks.

NEW DEALS

Campbell upgrades

Campbell Soup Co. in Toronto recently licensed a set of systems utilities from **Goal Systems International, Inc.** The company selected the Goal products as part of its upgrade plans to the IBM MVS/XA operating system.

The **University of Houston** installed a **Convex Computer Corp.** C210 minisupercomputer recently. The system will be used at the university's Allied Geophysical Laboratories, which are currently involved in a state-funded project called the State Lands Energy Research Optimization Program. The goal is to find ways to produce more oil and gas from Texas-owned lands.

Hogan Systems, Inc. said the Banco de Colombia in Bogota recently installed its Integrated Banking Applications package, which includes nine modules. The bank also signed a contract for Hogan's professional services offerings. The agreement is Hogan's first in South America.

Rolls Royce & Associates Ltd. has purchased **Unisys Corp.**'s Unix-based Infoimage Engineering Document Management System (EDMS) for the Derby, England, manufacturer's nuclear-submarine operation. Rolls Royce, which recently completed a beta test of the Unisys system, will use Infoimage EDMS to store new engineering drawings and to help retrieve some of its existing library of more than 1 million drawings.

Kaiser Engineers Hanford Co. in Richland, Wash., announced a $1.4 million contract with Digital Equipment Corp. last week to provide Unix-based workstations and servers to engineers and architects working at Kaiser offices at the U.S. Department of Energy's Hanford Nuclear Reservation. DEC will supply a combination of 60 Decstation 3100s and Decstation 5000 workstations running the Ultrix operating system. The machines will be used as servers and high-end computer-aided design (CAD) workstations to deliver Autodesk, Inc.'s Autocad software to Kaiser's engineering staff, located throughout the 500-square-mile federal site.

When it comes networking solutions,

Recognizing the full potential of networking is one thing—actually realizing it is another. To truly fulfill that potential, every component of your network needs to turn in a great performance. That's why IBM offers a complete range of leading-edge LAN products in the desktop networking field—giving you the broadest range of solutions available to continually advance your system's possibilities.

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At the heart of IBM networking are the members of the Personal System/2® family that act as high-performance LAN servers. The PS/2® Model 95 XP 486, IBM's sophisticated new 486™ computer, was especially designed to optimize network performance. The Model 95 features an Intel 33 MHz 486 processor or a 25 MHz 486 processor that's easily upgraded to 33 MHz, which quickens the pace of your LAN's operations. For your network's storage, not only are the Model 95's SCSI hard files lightning-quick, but the overall capacity is truly impressive—up to 1.6 gigabytes internally, and up to 8.96GB or more with IBM PS/2 External Enclosures. IBM also offers highly efficient, lower-cost server alternatives with the PS/2 Models 80 386 and 65 SX. All of IBM's PS/2 LAN servers feature the Micro Channel™ architecture, with its 32-bit data path and bus-mastering capabilities. The Micro Channel busmaster adapters allow you to expand your network's capabilities by adding multiple processors—like adding "computers" to your computer. It all amounts to highly reliable and powerful managers that inspire the same kind of performance from the rest of your network.

AN EFFICIENT WAY TO BRIDLE YOUR DATA.

Whatever your needs may be, IBM has PS/2s that can serve as excellent client stations. And if you want to keep a tight rein on your network's information, IBM offers the PS/2 Model 55 LS, a medialess LAN station version of the best-selling Model 55 SX. A cost-efficient alternative to models with storage drives, the Model 55 LS provides a wide array of effective management controls, including enhanced data security, consistency in software levels, central software maintenance and central file backup. Not only is the Model 55 LS easy to hook up (it comes standard with a Token-Ring Network or Ethernet adapter), but should you need to modify your system, it's easy to upgrade with diskette and file storage devices.

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Software that hits the ground running—that's our powerful new OS/2® V. 1.3, a high-performance, low-cost software package that supports both DOS and OS/2 clients on either a Token-Ring or Ethernet Network. Both the new OS/2 Extended Edition V. 1.3 and LAN Server V. 1.3 create an environment that delivers improved

to advanced IBM leads the way.

performance, less memory requirements, fewer DASD requirements and support for Adobe Type Manager™ fonts. And with support for 128 DOS requesters, LAN Server V. 1.3 can provide significant cost benefits for DOS network users. Compatibilities between IBM DOS LAN requester and the current version of Windows® 3.0 (LAN Manager 2.0 enhanced) have also been added, capping off the many ways IBM gives you greater flexibility in the LAN environment.

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For a great finish to any project, IBM offers a full range of printers for client stations, as well as the speedy, large-capacity IBM LaserPrinter, an efficient printing station with immensely attractive LAN benefits. With a high-duty cycle and fewer parts for fewer breakdowns, it offers extremely reliable printing while still boasting a 10-ppm printing speed. The optional paper bins allow for more efficient collation, so there's no need to visit and rearrange the printing station prior to the particular job. You can also easily and inexpensively upgrade to Adobe PostScript.® It all adds up to a range of complete, reliable printing solutions that can handle the kind of workload that any network, large or small, can generate.

Step Up The Pace With Token-Ring Network.

To optimize the link between your LAN server and client stations, you need a hardware connection that gives you access to departmental and company data, as well as communication with your co-workers—in other words, you need access to a winner's circle: the IBM Token-Ring Network, the winner four years running of the *PC World Magazine* World Class Award. It's a reliable and flexible networking solution, one of the only connections with a data transfer rate of up to 16MB per second.

You can also diagnose, isolate and correct problems in one section of your LAN without affecting the rest of your network. A system you can build on, IBM Token-Ring Network provides a reliable connection that's as strong as your need to keep in constant touch with the people and information around you.

Communicate With Horses Of A Different Color.

Of course, IBM provides you with several ways not only to connect your PS/2 LAN to a multitude of mid-range and mainframe systems, but also to communicate with non-IBM systems as well. To conduct transactions such as hotel reservations, car rental and credit card authorization, an IBM communications adapter such as the IBM ARTIC Portmaster Adapter/A busmaster card, with the proper communciations software, can link your PS/2 with other companies' computers. With an Ethernet adapter, you can also connect to most Ethernet LANs. The integrated communications options of IBM OS/2 Extended Edition software can also allow your PS/2 to send mail, transfer files and access applications on other systems concurrently. So it's easy to benefit from the strengths of an IBM network while still having access to the rest of the computing world.

With the many components that constitute a Local Area Network, it's plain to see why a LAN is only as strong as its weakest link. That's why the IBM total LAN solution—LAN servers, workstations, networking software, printing stations and Token-Ring Network—is simply without peer: because there are no weak links. To find out how IBM can keep your network ahead of the pack, contact your IBM Authorized Remarketer or IBM marketing representative. For a remarketer near you, call 1 800 272-3438.

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PRODUCT REVIEW

Tried-and-true Prokit falls short

McDonnell Douglas Information Systems International

This is the eighth in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whitaside, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we look at Prokit from McDonnell Douglas Information Systems International.

DEVELOPMENT PRODUCT BRIEFINGS WORLD

•

Carried out by McDonnell Douglas in Woking, England, its team of four people provided an attractive solution that was marred by an error in the batch interface that could not be resolved and a lack of adequate IBM DB2 expertise that resulted in certain elements of the application being inoperable on the mainframe. Taking these shortcomings into account, we awarded a grade of "fair" for the level of completion.

•

The team decided to use stand-alone personal computers for the application development. Crucial delays were caused by transferring solutions between the CASE tool, Prokit, and the implementation tool, Pro-IV, and were further aggravated by the manual exchange of data between stations. An excessive amount of time was spent on the interface section and in transferring the application to the mainframe environment. The benchmark and its enhancement were completed in 32 hours and 40 minutes. The overall effort of 66 hours and 50 minutes recorded for the team was pedestrian and thus was rated "fair."

•

A much improved picture emerged in the maintenance section of the testing, where randomly selected enhancements, previously unknown to the team, required a major rework of the solution. The actual maintenance speed was one of the shortest, compared with other benchmarks in the series. However, actual maintenance activity was restricted to the code and did not update the design. Nevertheless, the product's speed of maintenance had to be ranked as "very good."

•

There was plenty of documentation, although it was somewhat overwhelming. The graphics were certainly comprehensive, but the characters drawn in line graphics were hard to read. In contrast, the Pro-IV program listings provided a good picture of the detailed solution. On balance, we awarded a rating of "good" for documentation.

•

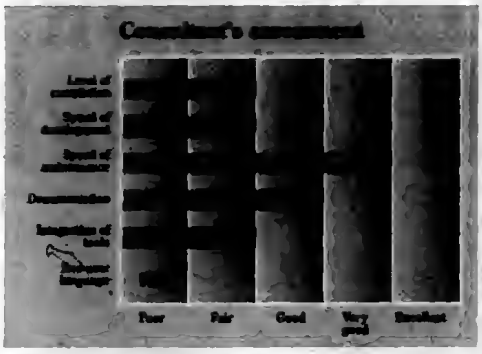
Data stores, entities and processes can be synchronized in the Prokit CASE tool and then downloaded to the implementation level. The downloading process, however, was unidirectional and not smooth. Although McDonnell Douglas has a well-established planning methodology (Stradis), it was not visible in the development environment. We marked the product's level of integration as "fair."

•

No end-user language was provided by McDonnell Douglas for running against DB2 files. IBM's QMF or SQL are normally the products employed for that purpose. Therefore, it received a rating of "not applicable."

•

In summary, the complexity of the task severely tested a well-proven product set. Despite the use of the well-established Prokit, the job was not completed without a considerable amount of trial and error. Perhaps in being "all things to all men," the benefits of mainframe environments have not yet reached their full potential.



The McDonnell Douglas tool kit

- Prokit — CASE tool
- Pro-IV — Fourth-generation language
- Progeny — Development utility
- Pro-aide — Development utility

Development and maintenance report card

Performance in each area is graded from A (excellent) to F (poor).

ANALYSIS AND DESIGN: C
The entities, data stores and the main processes were defined in the Prokit CASE tool and ready to be downloaded to the implementation phase. Unfortunately, any changes made during implementation were not incorporated automatically. This caused confusion, and an incomplete DB2 schema was generated by Prokit. The CASE tool graphics, produced on a McDonnell Douglas computer-aided design and manufacturing tool, looked a bit antiquated and were hard to capture for desktop publishing.
Strength: Prokit covers most aspects of the design.
Weakness: It is a single-user tool.

DATABASE SETUP: D
The design data structure was downloaded automatically but needed manual refinement to cater to details such as "null" field handling. Final transference of the personal computer-developed systems to DB2 on the mainframe entailed a lot of manual adjustment to adhere to naming conventions. Interesting items considered in file setup were volumes and frequency of use.
Strength: The product has a wide range of data attributes.
Weakness: Additional work-around is necessary.

FILE MAINTENANCE TRANSACTIONS: C
This stage took an unexpectedly long time with much trial-and-error debugging before all the detailed rules were contained in the Pro-IV structure. Some overlays had to be used to handle screens with multifile data.
Strength: Single file transactions are highly automated.
Weakness: It is not always easy to manipulate the preset defaults.

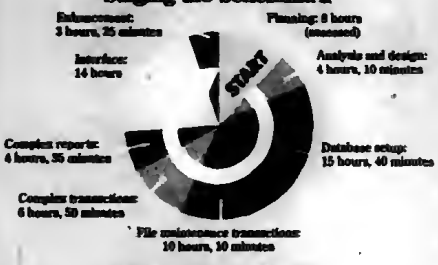
COMPLEX TRANSACTIONS: C
Again, a lot of detailed work was required before a satisfactory solution was achieved. The Pro-IV concept of not displaying incorrectly entered fields was disturbing. A real expert saved the day.
Strength: Solutions are well-presented.
Weakness: It requires a lengthy debugging process.

COMPLEX REPORTS: C
The report layout was specified in "screen painter" fashion. However, some dummy files and fields confused the solution and contributed to a mediocre completion time.
Strength: It has a good report painter.
Weakness: An interim file is required.

INTERFACE: D
After several attempts, an Ashton-Tate Corp. Dbase file was finally converted but still caused some problems in distinguishing numeric and alphanumeric data. The batch processing logic was never completed, and therefore, the final results could not be checked.
Strength: It has good special batch processing facilities.
Weakness: It handles unfamiliar data poorly.

ENHANCEMENT: A
The selected enhancement was one of the most demanding so far in the series, yet it was handled with ease. Often, the design documentation was not consulted and remained unchanged.
Strength: Pro-IV solutions are very easy to change.
Weakness: Enhancements are restricted to the implementation level.

Staging the benchmark



Total effort: 66 hours, 50 minutes
Elapsed time: 32 hours, 40 minutes
Team size: 4

The solution was initially developed on three stand-alone IBM Personal System/2 Model 70s under DOS Version 4.0. The completed solution was then transferred and tested on an IBM 3090 mainframe under MVS/CICS and DB2.

Details about the product are available from McDonnell Douglas Information Systems International, Information Systems Engineering, Building 281, 5757 Phantom Drive, Hazelwood, Mo., 63042, (314) 232-2996.

Chicago schools

CONTINUED FROM PAGE 25

fourth-generation language, the database contains an impressive amount of information on each student and school, including anything from each pupil's transcript to "what language they speak at home," Cox said.

With his information infrastructure in place, Cox next wanted to provide administrators, teachers and students with direct access.

Called Project Inform, the system would seem fairly conventional at a college, where many on-line information networks have been created over the past 15 years. But few public school systems have stepped up to the challenge, according to Cox.

Project Inform has currently placed terminals in six high schools and 11 elementary schools. The hardware and wiring costs for six terminals — four for students, two for the librarians — is $8,000.

Bypassing expenses

Leveraging his school system's size, Cox approached database operators and purchased copies of their databases to run on the school system's computers. Doing so bypassed the communications expense involved in the normal dial-up access to those databases via information networks.

A school system network, now composed of 75 9.6K bit/sec. leased lines, carries the data between the schools and the Unisys and IBM hosts in the administration building.

Multiple Unisys distributed communication processors provide the Transmission Control Protocol/Internet Protocol and Systems Network Architecture gateway between the administrative and research databases on the 2200/622 and the financial applications on an IBM 3090 mainframe. It even allows a user to pull down information about the individual school's budget and salaries.

"I envision each [school] library with four terminals," Cox said. From the terminal, a student or school employee could, for example, access a card catalog of books in that library, other school libraries or the Chicago Public Library, as well as a growing list of databases.

In addition, the Unisys host contains on-line versions of the Grolier's Academic American Encyclopedia, the Chicago Public Schools' budget and the Educational Resources Information Center, a popular educational research index put out by the U.S. Department of Education.

Other planned offerings include the following:

- An index of local newspaper articles.
- A services directory listing public, nonprofit and private agencies.
- A public events calendar.
- Job and college course bulletin boards.

"If I had my druthers, I'd take three years and put terminals in all the schools," Cox said. Such a project, he added, would cost about $4.8 million over that period of time.

Wish list

More ambitious still would be to provide network-linked personal computers to each of the school system's 16,000 teachers. Cox estimated it would cost about $3,000 per teacher, or $48 million, to put a PC and wiring into the network on every teacher's desk. "Business routinely does that. It recognizes the need to put information systems technologies on every desk," Cox said.

Even so, Cox is optimistic that there will be a shift in public policy. "Eventually," he declared, "there'll have to be a statewide — if not federal — initiative to target substantial amounts for computer technology."

For now, however, Cox must make do with few computers in the classroom and a lean IS staff. His staff has shrunk over the past few years to 130, which includes 50 people in operations and 40 more in systems development. About 3% of Cox's $27 million annual budget for IS and telecommunications goes to Project Inform.

An important future step, Cox said, will be a system to automatically match students with various educational needs with the resources of the school system. "We have a database on students, and we have instructional software. The missing link is knowing the individual instructional needs of each student."

Wang

CONTINUED FROM PAGE 25

ber of end users that can reside on the system," Gillman said.

"This was a problem that was identified several years ago, and Wang said it would be available in the first half of 1991," Gillman added.

According to David Strohmeyer, VS product manager at Wang, a limited version of the operating system, designated 7.30.04, was released in early December, and a full production version will be available this month.

Willmott concurred that Release 7.30.04 will definitely make a significant difference to the installed VS base, where a major concern for Wang customers at present is getting the maximum bang for the buck.

With reference to Wang's future, Willmott observed that overall, the company's financials seem to have been put into place, but be cautioned that the company will have to continue to offer support, enhancements and services for its VS users in order to remain profitable during the transitory period to open systems.

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CW

NEW PRODUCTS — HARDWARE

I/O devices

Advanced Technologies International, Inc. has introduced a 15 page/min. printer designed for distributed printing environments such as large offices.

The LC-6015 ($9,500) features a proprietary controller, the LC-6000, which enables the device to print graphics five times faster than comparable units, according to the vendor.

The product is equipped with 500-sheet input and output trays and includes emulation packages for Diablo Systems, Inc. 630, Hewlett-Packard Co. Laserjet 500/2000 and several other printers.

Advanced Technologies International
355 Sinclair-Frontage Road
Milpitas, Calif. 95035
(408) 942-1780

Interface Systems, Inc. has announced its ISI 8262-T series of band printers designed to be linked with IBM Application/System 400s, System/36 or 38 computers via a twinaxial connection.

The series includes the ISI 8262-T13, which can yield solid-formed letter-quality output at a rate of 350 line/min., and the ISI 8262-T03, which operates at a maximum speed of 700 line/min., according to the vendor.

List pricing for the ISI 8262-T13 and ISI 8262-T03 starts at $8,850 and $10,800, respectively.

Interface Systems
5855 Interface Drive
Ann Arbor, Mich. 48103
(313) 769-5900

NEW PRODUCTS — SOFTWARE

Development tools

Telesoft, Inc. has announced releases of Teleuse, its graphical user interface-based development tool, for the IBM RISC System/6000, Hewlett-Packard Co.'a Apollo and HP 9000 machines and Digital Equipment Corp. VAX/VMS platforms.

The four versions provide users with a set of tools to design, prototype, evaluate, code and maintain graphical user interfaces. An interactive graphical editor is also featured.

Pricing for Apollo, HP 9000 and IBM RS/6000 platforms is $7,500 per workstation. The VAX/VMS version costs $9,000 per workstation.

Telesoft
5959 Cornerstone Court, W.
San Diego, Calif. 92121
(619) 457-2700

Applications packages

Business Computer Design's recently announced Progen Plus Release 2.3 application generator enables users of IBM Application/System 400s or System/38s to save and reuse program design definitions.

The product also includes enhanced prototyping of screens and a flexible screen painter for designing subfile list panels.

Pricing is $2,950 or $4,500, depending on type of system.

Business Computer Design
950 York Road
Hinsdale, Ill. 60521
(708) 986-0800

Utilities

A/Soft Development, Inc. has announced a version of its Nu/TPU text editor that uses the same commands as Digital Equipment Corp.'a VMS Extensible VAX Editor and enables programmers to change functions assigned to a specific key.

The product is source code-compatible with DEC's VMS 5.0 Text Processing Utility, a tool that allows programmers to develop applications on Unix and DOS platforms while remaining in a VMS environment.

Pricing for Version 2.1 of Nu/TPU ranges from $499 to $5,000 for Unix-based platforms. MS-DOS-based versions cost $325.

A/Soft Development
11 Red Roof Lane
Salem, N.H. 03079
(603) 898-6690

Lotus says new Windows options beat all others

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — What, Lotus worry now that Microsoft has unleashed Excel Version 3.0? Its 1-2-3 for Windows spreadsheet is not even in beta testing yet, but a confident Jeffrey Beir, director of product marketing for Lotus Development Corp.'a Graphical User Interface Spreadsheet Group, claimed last week that Lotus "will provide capabilities in 1-2-3 for Windows not seen in spreadsheets before."

Expected to ship in June, 1-2-3 for Windows will be fully compatible with Microsoft Corp.'a Windows 3.0, according to Lotus. Beir said Lotus has shown the package to "several hundred" customers so far, and he expects it to go into beta testing in a few months.

"We recognize the need to get 1-2-3 for Windows out in the market," Beir said.

His goals for 1-2-3 for Windows include making it the best Windows spreadsheet and providing 100% compatibility with character-based 1-2-3 commands. "Microsoft can't do [the latter]," he said.

Noting that most users do not tap even 60% of the capability of their spreadsheets, Beir said his group is focusing a lot of effort on usability issues for existing and new classes of spreadsheets. Despite the one-upmanship practiced by Lotus and Microsoft marketers, Beir predicted future spreadsheet battles will focus less on features and more on ease of use and support.

Two weeks ago, Lotus announced a $49 upgrade to 1-2-3 for Windows for buyers of 1-2-3 Version 3.1. Lotus was encountering some resistance among users who were "stalling" migrations to 1-2-3 Version 3.1 because they knew 1-2-3 for Windows was coming, Beir said. The promotion is Lotus' way of telling them "not to worry, we'll protect your investment," he added.

Recognizing that many Lotus users are standardized on 1-2-3 Version 2.2 (v. Version 3.0 or 3.1), Beir also hinted that the $49 upgrade may be expanded to allow other Lotus users the same inexpensive upgrade to 1-2-3 for Windows.

He described the promotion as a break-even proposition, saying Lotus expects to amortize the cost over a large number of unit sales.

Overall, Beir said, Lotus does not expect to get a large percentage of its revenue from Windows in 1991 but will have different expectations for the 1992 to 1994 time frame.

Beir and many Lotus users were quick to deflate the notion that the microcomputer world is quickly migrating to Windows.

"Most users will be in a decision-making mode during the next six to 12 months," Beir said, adding that Lotus has plenty of time to make an entrance into the Windows market.

Forms processing use to grow

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

You might remember the forms processing market, the one that was going to be the next coming of the spreadsheet, the word processor and the like.

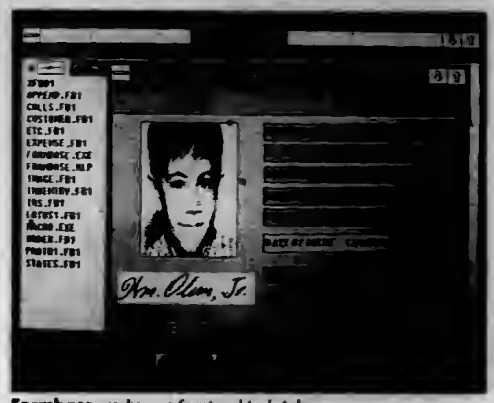
More likely, it has faded into memory as you puzzled over newer software markets that proponents claim are burgeoning, such as multimedia. But the market for forms processors remains alive, with new products and upgrades. Some advocates still say — though less loudly than once was the case — that forms processing packages will indeed become a hot application.

First, however, vendors and users have to agree on what a forms processor really is and what it does for them. This is no easy task because a form represents anything from a complex Internal Revenue Service 1040 form to a personal check or a telephone message.

"The forms processing market is one of these really weird markets . . . It's very hard to define," said Amy Wohl at Wohl Associates in Wynnewood, Pa. "When you say forms, do you mean designing forms, filling in forms, both of those things or fill in the form and save the data in the database so that the database is an important part of the exercise? Will it exist on the computer screen mainly, or only for the purpose of being a onetime master that will be on paper mainly?"

Wohl said she doubts that forms processors will be "the next spreadsheet market." However, she said she thinks that the opportunity to improve forms electronically will continue to generate good ideas.

"I'm not sure it's going to be a big market," Wohl said. "I think it's part of the database market. I think when you talk about forms, . . . what you're really saying is, 'please God, give me an easier way to use a database.' "



Formbase *works as a front end to databases*

While agreeing that forms processors seem easier to use than databases, Rich Finkelstein at Performance Computing, a database consultancy in Chicago, said he thinks they actually can make data use more difficult.

"There've been lots of products out in the last two to three years, and I look at them, but I just don't see the use for them," Finkelstein said. "What does it buy you? It appears to be simpler, but that's because you've eliminated all your editing and integrity constraints — the things that keep people from messing up databases."

The best known products, such as Xerox Desktop Software's Formbase, work as front ends to a database. Users confirmed that the products do not yet address their needs.

"There are issues I would like addressed along the lines of protecting us from user screwups," said John Marshall, vice president of Main Street, a caterer and food distributor in Kingston, N.J. Main Street uses Formtype, a database front-end package from Easy Automation Systems, Inc. in Norcross, Ga. Still, Marshall said, "I've been jumping up and down at the speed with which I can view dif-

Continued on page 40

Micro Focus brings 370 Assembler to the PC!

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HEWLETT PACKARD

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San Jose police first to use Gridpad

Pen-based handheld computer shortens processing time for paperwork

ON SITE

BY JAMES DALY
CW STAFF

SAN JOSE, Calif. — An amber dusk creeps over Northern California as a blue-suited San Jose police officer preparing for duty runs through a checklist of the tools needed for another 10-hour shift. Shield? In place. Service revolver? Tucked in the holster. Nightstick? Dangling loosely. Gridpad? Huh?

During the next week, the latest crimefighting feature of the largest police force in the Silicon Valley will be in place as the San Jose Police Department becomes the first major law enforcement agency to use Grid Systems Corp.'s Gridpad, the only pen-based handheld computer commercially available in the U.S.

Although the machine will not batter down the doors of drug czars or fell fleeing robbery suspects, the Gridpad will battle what is frequently regarded as an officer's most tiring enemy: paperwork. The 4½-pound Gridpad — which is about the same size as the clipboards the officers already carry — will be used to enter information directly into the computer at the crime or accident scene.

Unlike many portable computers, the Gridpad does not use s keyboard or mouse to enter data. Instead, information is handwritten into the computer using a pen and pad. Therein lies its potential for success.

"The processing of reports is quite s lengthy procedure," systems liaison officer Tony Weir said. A submitted report typically travels through a series of coding and quality-control steps. Inspectors may scrutinize the document to make sure the correct forms are attached or to see if any suspects immediately spring to mind. But such vigilance has its price: It often takes anywhere from three to five days from the time an officer signs his name on the report until it reaches an investigator.

Pen-based handheld *computers allow officers to enter information at the scene of a crime, significantly reducing their paperwork at the end of a shift*

With the Gridpad, a disk is popped out at the end of a shift and uploaded to the department's main record management system. Processing time is reduced to only a few hours. "With nearly 1,000 officers filing more than 100,000 reports per year, the time savings is going to be enormous," Weir said.

The department will test s handful of Gridpads through the middle of the year. If the program is successful, Gridpads will be mounted in nearly all of the department's 300 vehicles. During the assessment period, the Gridpad will take the place of half a dozen paper documents, ranging from accident reports to missing person write-ups. Software for the Gridpad has been supplied by The Windward Group, a Los Gatos, Calif.-based software development company.

The key to the program's success, Weir said, is getting the Gridpad to understand the officers' handwriting. At this stage in their development, pen-based computers work best when users carefully print the information, although the technology is evolving so that the recognition of even sloppy handwriting will soon be a reality.

Although each officer will be given several hours of training with the Gridpad, Weir will not be dealing with computer novices. The department's officers are already well acquainted with the world of high-technology law enforcement. All department police cruisers, for example, are equipped with Motorola, Inc. mobile data terminals, which are mounted on their dashboards.

To ease the transition, however, the Gridpad will include a keyboard, so officers will be able to key in data in adverse situations. "For instance, trying to write in s vehicle in pursuit could be quite a problem," Grid spokesman Dave Marino said. "I don't think anyone's handwriting would be readable when it's done from the front of a speeding car."

Vendor companies show off their wares at Macworld

BY JAMES DALY
CW STAFF

SAN FRANCISCO — Nearly 60,000 Apple Computer, Inc. Macintosh zealots gathered at the sixth annual Macworld Expo recently as more than 500 vendor companies came together to show off their latest and greatest achievements for the Macintosh line.

Meanwhile, Apple Chief Executive Officer John Sculley used the pulpit of his keynote address to sing the praises of the newly available Macintosh LC and to assure users that the firm is going to great lengths to ensure that it will not stagnate technologically. "We need to reach into the soul of Apple," Sculley said during the 50-minute address.

Sculley indicated that Apple is experimenting with infrared technology to produce wireless computer networks — a concept that has drawn attention recently throughout the networking industry — and that the Cupertino, Calif.-based firm's next major priority is to produce a lightweight notebook-size computer. Sources said such a machine could come as early as August 1991.

Early indications that Apple would use the four-day Macworld to introduce s new portable proved false. Although early press summations of new products listed an Apple portable introduction, none was scheduled.

This year's show bowed to the pressure of Macintosh enthusiasts, who complained that previous shows catered more to corporate users, and included expanded evening show hours and a weekend schedule. At the show, there was little in the way of breakthrough technology introductions or new applications. Most of the displays were concerned with upgrades and products that were announced months ago but which only began shipping recently.

Among the new Macintosh products introduced were Apple subsidiary Claris Corp.'s new version of Macdraw Pro; additions to Rasterops Corp.'s line of monitors; and Meridian Data, Inc.'s in-house compact disc/read-only memory mastering system (see story page 41).

Some of the other products introduced at Macworld included the following:

- On Technology, Inc., the latest brainchild of Lotus Development Corp. founder Mitch Kapor, introduced Meeting Maker, which helps network users schedule meetings by showing what times co-workers are available. Meeting Maker's suggested retail price is $495 per five-user pack and $895 per 10-user pack.
- Microsoft Corp. announced Microsoft Mail Version 3.0 for Appletalk networks. The product is expected to be available this quarter for approximately $395.
- Rochester, N.H.-based Cabletron Systems, Inc. brought the speed and efficiency of token-ring networks to the Macintosh II line's Nubus architecture environment with the introduction of the Token-Ring Network Interface card. The card is slated to be available in March for $1,295. The company also introduced several network monitoring and troubleshooting products.

Now you can do program development and maintenance on the PC the same way as you do on the mainframe with SPF/2, a new OS/2 alternative to working with ISPF/PDF.

Written specifically for OS/2, SPF/2 offers the same familiar environment, command structure and editing capabilities. SPF/2 utilizes virtual memory to handle very large files, multi-process technology for split screens, and an interface to OS/2's REXX as a macro language.

SPF/2 includes 75 ISREDIT commands that interface with REXX. Therefore, you may write your own commands and assign them to the 48 programmable function keys. Your existing mainframe REXX edit macros will also run with SPF/2.

SPF/2's 3270 compatibility also contributes to your ease-of-use on the PC. SPF/2 processes keystrokes in the same way as the OS/2 Extended Edition 3270 emulator, including NEW-LINE and ENTER. SPF/2 also displays 3270-style status indicators.

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Micro Express' ME 486-25: Low-cost power

Technology Analysis — a roundup of expert opinion on new products. Summaries written by Computerworld *staff member Derek Slater.*

The Micro Express ME 486-25 is a low-cost XT/AT bus-based machine whose performance belies its price, leading personal computer publications say. The ME 486 outpaces many better-known systems in a number of benchmark tests. Though Micro Express' service policies fail to impress, the ME 486 is an excellent low-price option for power users, reviewers say.

Performance: The speed of the ME 486 is boosted by its 128K secondary memory cache. Disk-performance speed is outstanding when the system is configured with an enhanced small device interface disk controller.

Compatibility: *PC Week* reports a compatibility problem with a Colorado Memory Systems, Inc. tape drive.

Documentation: Micro Express provides technical manuals from the individual component manufacturers and a single illustrated manual covering the ME system.

Support: The company offers a two-year warranty and replaces defective parts by mail. However, it provides no on-site technical service.

Value: Despite minor complaints, reviewers agree that the ME 486 is an outstanding buy for the money: $5,570, including an IBM Video Graphics Array-compatible monitor and 100M bytes of hard disk space.

Server capabilities: The XT/AT bus architecture may limit the server efficiency of the ME 486. However, no tests were run using it as a server.

Reviews Summary

Criteria			
Performance	Excellent	9	Top-end performance
Compatibility			
Design	Average	NC	Quality system
Documentation			
Support	NC	NC	No on-site service
Value			
Reviewer's score	7.4	9	One you should definitely consider

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

- **Users:** Alan Dang, Red Brick Systems (*performance:* 10, *cost:* 9); Ron Dixon, Trax Corp. (10,10); Jim Garrison, Freeman Hospital (10,9). "It's cheap. [Micro Express] gets it to you fast, and it's faster than the other machines," Dixon said.
- **Analyst:** George Thompson, Datapro Research Corp. (7.7)
- **Financials:** Matt Heidari, California Financial Corp. (*overall rating:* 8). "They are much smaller than the big public companies, but they are debt-free and have grown consistently," Heidari said. Micro Express reports current sales of $35 million per year — approximately double last year's rate. The company was founded in 1986 and has 50 employees.

ME-486

score:

Points (maximum)	Category
25 (30)	Published reviews
14 (20)	Analysts' ratings
15 (15)	Users' ratings
18 (20)	Cost evaluation
12 (15)	Vendor financials

(Maximum score: 100)

Micro Express responds

Art Afshar, president of Micro Express:

Documentation: New documentation will be available by February.

Service: We're finding the people we sell to very competent at replacing defective parts, which we send by overnight express.

Server capabilities: We offer a special tower case with room for 10 drive bays, a 450-watt power supply and several cooling fans as a server configuration.

Dell's System 425E: Unix power quick and easy

The Dell Computer Corp. System 425E is an unusual Extended Industry Standard Architecture-based 486: Its chosen operating system is Unix, although it can be bundled with software to run MS-DOS applications. Dell's machine is also notable for strong performance, expandability and compatibility, according to reviewers at leading personal computer publications. The system is priced at $6,499.

Performance: The System 425E achieves performance equal to most Intel Corp. I486-based machines through the use of the standard 8K bytes of cache memory built into the processor chip. Video speed is outstanding, although *Byte* found resolution somewhat low.

Compatibility: Software compatibility is excellent. DOS applications, including graphics, run without a hitch. Networking the System 425E with DOS-based PCs requires an additional Partner Kit ($399). The low 230-watt power supply could also pose compatibility limitations.

Documentation: The documentation is praised for its completeness and simplicity. Dell provides manuals covering installation and user start-up as well as technical service.

Support: Dell offers one year of unlimited toll-free telephone support and next-day, on-site service through Xerox Corp.

Value: The system comes with a 100M-byte drive and 4M bytes of random-access memory.

Server capabilities: The Dell System 425E scores comparably with leading 486 systems in network benchmark tests. It is certified for use with networking products from Novell, Inc., IBM and Banyan Systems, Inc.

Dell 425E

score:

Points (maximum)	Category
23 (30)	Published reviews
16 (20)	Analysts' ratings
14 (15)	Users' ratings
18 (20)	Cost evaluation
12 (15)	Vendor financials

(Maximum score: 100)

Reviews Summary

Criteria	LAN Times	[illegible]	[illegible]
Performance	Excellent	8	You'll be impressed
Compatibility	Average	8	
Design	Average	NC	Distinguishes it from competition
Documentation	One of the [illegible]	8	
Value	NC	8	NC
Reviewer's score	7.9	8	

Numeric ratings are based on a weighted scale of 1 to 10 where 10 is best. NC: No comment. These are excerpts from reviews. Refer to actual articles for details.

RATINGS

- **User:** Robert Ducate, Ducate Co. (*performance:* 10, *cost:* 10); Peter Kopkunas, Blackstone Group (9,10)
- **Analysts:** George Thompson, Datapro (8,8); Jerry Curon, Faulkner Microcomputer Reports (8,8)
- **Financials:** Eric Zinita, Rauscher Pierce Refsnes (*overall rating:* 7); Bennie Lorenzo, Dillon Read (8); Jim Poyner, William Woodruff & Co. (8); Jim Weil, Soundview Financial Group (8). Dell's revenue was $378.9 million for the first nine months of fiscal year 1991 vs. $388.6 million for all of fiscal 1990. Net income for the same period was $18.6 million vs. $5.1 million total in 1990.

"Fiscal '90 was a difficult year — [Dell] overextended themselves. But they've turned it around," Weil said.

Dell responds

Paul Rubin, director of product marketing:

Performance: The System 425E doesn't have integrated graphics; we offer both low- and high-resolution options.

Compatibility: The power supply is adequate. We haven't had any complaints from users.

Server capabilities: The large disk capacity and six Extended Industry Standard Architecture expansion slots make it excellent for networks of up to 20 users.

Methodology: *Published reviews: average of numeric scores from product reviews published by PC publications listed in reviews summary chart multiplied by three. All ratings are based on a 1-to-10 scale, where 10 is excellent. Analysts: average overall product ratings multiplied by 2. Users: average overall product ratings multiplied by 1.5. Cost: average cost to get product up and running ratings from both groups multiplied by 2. Financials: average of analysts' ratings of vendor financials and ability to support product from financial analysts multiplied by 1.5.*

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Forms processing

CONTINUED FROM PAGE 35

ferent things in different ways" and added that installing Formtype has tremendously improved the company's order-processing efficiency.

Jeffrey Tarter, editor and publisher of "Softletter" in Watertown, Mass., agreed that forms processors have had trouble attracting buyers because of their vague nature.

"It's a product that falls across a traditional division of labor — forms drawing and database design," Tarter said. "Another problem is that creating a form or replicating a form . . . electronically is a huge job."

Tarter said he thinks the market has the potential to boom.

"We're awash in forms, and they should be ideal for automation," he said. Tarter added that he thinks the reason form processors have not been more popular is because they miss the basic point of a form: to communicate information.

"Forms are not really just a piece of a database. Probably the most important use of forms is in communications," Tarter said. "If you take most forms, they are simply a way of conveying a large amount of very structured information from one person to another."

Tarter said that the existing personal computer-based packages are largely lacking in communications facilities, unlike their bulky mainframe-based cousins. He said that vendors of PC-based forms packages are beginning to correct this and that the increase of networks will push forms processing into a more important role in corporations.

"Moving forms through a network is probably a lot more important than electronic mail," Tarter said.

D&B enhances personnel system

BY SALLY CUSACK
CW STAFF

ATLANTA — Dun & Bradstreet Software last week released an enhanced version of The Human Resource, the company's personal computer-based human resources software package.

According to the vendor, Release 4.02 offers over 30 additional functions, such as screen painting, menu and database customization and field-level security.

Clare Gillan, a senior analyst at International Data Corp., a Framingham, Mass.-based market research and consulting firm, observed that traditionally, D&B Software has not been aggressively attacking the PC marketplace.

"They need a distributed PC application to be competitive and offer their customers flexibility," Gillan said.

The package, capable of running alone or in a distributed processing environment, consists of six integrated modules, including personnel, payroll, profit sharing, pension, Consolidated Omnibus Reconciliation Act, or Cobra, and flexible plan administration.

Lori Flynn, payroll supervisor at Keystone Provident Life Insurance Co. in Boston, started beta-testing the product last January and describes the latest release as "very easy to use."

"We're always in a crunch-time situation here in payroll, so it's important that the computer system is easy to work with," Flynn said.

Keystone Provident, with 254 active employees, is currently running the package on Intel Corp. 80286-based IBM-compatible machines over a six-user Novell, Inc. local-area network. According to Flynn, the company has received excellent support from D&B Software.

The software is currently available, and modules can be purchased individually or in combination, the vendor said. It requires a DOS-based IBM or compatible PC, with a hard drive and a minimum of 640K bytes of memory. Pricing ranges from $30,000 to $80,000.

MICRO BITS

Lotus adds to 1-2-3's list

Lotus Development Corp. announced plans last week to add another notch to its 1-2-3 belt of supported platforms. This time, Lotus is teaming up with **Hewlett-Packard Co.** to develop and market 1-2-3 for the HP/Apollo 9000 Series 400 workstation family and the HP 9000 Series 300 line. Delivery is slated for midyear. Lotus will also port its Datalens developer tool kit to the HP platform.

Mark Tolliver, marketing manager at HP's Workstation Group, said he sees a trend toward the purchase of workstations for commercial applications, adding, "We expect an enthusiastic response to 1-2-3 from our customers."

Radio Shack said its **Tandy Learning Centers**, located in 123 Radio Shack Computer Centers, will offer supervised, self-paced one-day instruction on a variety of software programs. This enables students to take a class on any topic on almost any date. Class fees range from $99 to $139 per student.

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	MFLOPS	MIPS	SPECmark™
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DECstation 5000-200	3.7	24.2	18.5

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A smorgasbord of solutions. Applications already announced include the IBM engineering design packages CADAM®, CAEDS®, CBDS®,

MFLOPS are the results of the double-precision, all FORTRAN Linpack test 100x100 array suite. The Dhrystone Version 1.1 test results are used to compute RISC System/6000 Integer MIPS value where 1,757 Dhrystones/second is 1 MIPS (Nov. 11/1988). SPECmark is a geometric mean of six benchmark tests. All performance data are based on published benchmark information.

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Peripherals debut at Macworld

BY GARY BYRNE
CW STAFF

SAN FRANCISCO — At the Macworld Expo held last week, Mountain View, Calif.-based Digital F/X, Inc. announced Soft F/X, an off-line video editing software package designed for Apple Computer, Inc. Macintosh II systems.

The product's disk-assisted editing feature enables users to edit complete video programs while using only a Macintosh II. Edited programs can be assembled by using Video F/X, the company's desktop video production system.

Soft F/X ($995) allows work groups to edit video projects simultaneously at their desktops and enables users to trim clips, superimpose graphics over live video and create transitions, the vendor said.

Other products introduced at the show include the following:

- Claris Corp.'s Macdraw Pro ($399), a software package designed to facilitate drawing and design applications on Macintosh systems. The product allows users to select from built-in colors, gradients and patterns that can be accessed from pop-up pallettes within a menu bar.
- Insignia Solutions, Inc.'s entry-level version of Softpc ($199.95), its personal computer emulation software for Macintosh Classic and LC systems, features complete Intel Corp. 80286-based system compatibility.

The product enables more than 50,000 MS-DOS off-the-shelf and customized PC programs to be run without modification on Classic or LC systems, the vendor said.

The company also introduced Version 1.1 of Accesspc ($129.95), a utility designed to allow MS-DOS files to be managed on a Macintosh. Both products are slated to ship next month.

- Norad Corp.'s Norad Shield Model 2524-P ($129) was designed with a monofilament metalized mesh to protect users of Macintosh Classic systems from radiation and glare. The platinum device features a flexible frame that can match the color and bezel shape of the Classic. A version for 16-in. monitors, the Norad Supershield, is priced at $249.
- Meridian Data, Inc.'s Maccd, a compact disc/read-only memory (CD-ROM) mastering system designed exclusively for Macintosh systems, can accommodate low-volume, in-house CD-ROM production without requiring outside manufacturing facilities, according to the vendor.

The product is priced at $34,000.

- Rasterops Corp.'s 24STV complete real-time video processing system combines 24-bit video integration, graphics acceleration, video overlay and video compression in a device that fits into a single Nubus slot.

The product enables users to display 24-bit images, capture images or overlay graphics onto live video through a Nubus adapter. It supports 640- by 480-pixel screen formats at 72 dot/in.

The 24STV is scheduled to ship next month and is priced at $1,795.

Rasterops also announced the following products:

Clearvue/XL, a 21-in., two-page monochrome display system designed for the Macintosh II; the Clearvue/Classics line of 19- and 21-in. monochrome display systems and boards designed for the Macintosh Classic; the 8LC display board, which provides Macintosh LC users with 256 colors or shades of gray on a 19-in. monitor with a 75Hz refresh rate; and other 8LC, gray-scale and monochrome display boards and systems for the Macintosh LC.

Pricing ranges from $495 to $3,795, depending on configuration purchased.

- Sigma Designs, Inc.'s Sigma Bullet 3040 ($1,999) is a 40-MHz Motorola, Inc. 68030-based accelerator add-in board designed for Macintosh IICI and IISI systems.

The board features lossless data and image compression as well as a 32K-byte static random-access memory cache.

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Toshiba enters chip set market

IRVINE, Calif. — Toshiba America Electronic Components, Inc., a U.S. subsidiary of Toshiba Corp. in Japan, entered the chip market recently with the introduction of its Intel Corp. I486-based peripheral chip set designed for IBM Micro Channel Architecture (MCA)-based computers.

The four-chip package, which is scheduled for availability in July, is a peripheral chip set based on Micral's proprietary Short Line Interface Kernel systems architecture. It consists of a bus master direct-memory access controller, an address buffer/data buffer, a memory/bus controller and a peripheral support chip, according to Micral President Charles Smoot.

These chips replace 55-chip configurations that are found in other MCA-based personal computers and are packaged as a daughter card that can be varied, Smoot said.

The chip set will support an Intel I486 microprocessor operating at maximum frequencies of 25 or 33 MHz, according to the company. The cost is $250 per chip set in quantities of 1,000. Manufacturing and marketing will be done by Toshiba.

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Novell users await '91 products

ANALYSIS

BY JIM NASH
CW STAFF

Although much of what users and analysts expect from Novell, Inc. this year is simple delivery of promised goods, some hold out the hope for bigger things, such as a less expensive, downsized version of Netware 386 for smaller companies.

As 1991 moves into full swing, observers are confused about just where Novell stands in its product delivery cycle. Some packages, such as its naming service and remote management facility, are being quietly, belatedly shooed into the market.

Other products that have been expected for years, such as System Fault Tolerance Level III (SFT III), remain in alpha- or beta-test limbo. Novell has hinted that SFT III might exit beta testing this fall. However, the Provo, Utah-based company has adopted a stony silence on most products.

Several observers have noted the need to revamp Novell's packaging strategy for Netware 386. Officially, Novell refuses to comment on the likelihood of any 386 strategy changes.

Nonetheless, users and analysts said they have heard that the company will break Netware 386 out of its current large-corporation orbit. In 1991, observers predicted, Novell will reprice Netware 386 and offer options more in line with the needs of smaller companies.

Todd Booth, local-area network manager at Quotron Systems, Inc., a software developer in Los Angeles, said the idea makes increasing sense as Intel Corp. 80286- and 80386-based personal computers become more affordable.

"Some users are running Netware 286 on 386 machines," he said. Most would upgrade if Netware 386, with a list price of $7,995, was brought down from the pricing stratosphere, Booth predicted. Netware 286 Version 2.15 lists for $3,295.

"The key thing that Novell must do in 1991 is get the bulk of its sales based on Netware 386 and off Netware 286," said Craig Burton, an industry analyst and chief executive officer of Clarke Burton Corp. in Salt Lake City.

Burton said that although he had not heard Novell would stratify Netware 386, the move to market it to discrete groups such as large firms will become ever more important.

"They may have had the capacity in 1990 to milk Netware 386 at its luxury price," Burton said, but that will not last.

A different system

Burton said many Netware 286 users see Netware 386 as a virtually different operating system. When they decide an upgrade is needed, he added, many Netware 286 users will look at competing systems that may seem at least as foreign as Netware 386.

Darrell Miller, Novell's executive vice president of marketing and services, said a decision to change Netware 386's packaging had not been made. In the past, Miller said, he reviewed the product's marketing strategy regularly, but he has found no plan better than the current one. Today, Netware is marketed to discrete groups of users ranging from small offices and first-time buyers to massive, network-savvy corporations.

Miller said, however, that the company would field minor updates for Netware 386 and Netware 286 some time in 1991.

Information systems managers seem more confident about product expansion than Miller does. Booth said he expects to see a dual-protocol stack sporting Transmission Control Protocol/Internet Protocol (TCP/IP) and Novell's interpacket exchange (IPX) this year. A third-party kluge exists, he explained, but it is a cumbersome way for users to run TCP/IP applications from a single PC running Netware.

A spokeswoman for Novell said no announcement for a dual-protocol stack had been made, citing the company's policy about not commenting on products while they are in testing.

Most users said they expect Netware connectivity with Apple Computer, Inc.'s Macintosh line to be delivered in the first half of 1991 just as the naming service and remote management facility were delivered: without fanfare and behind schedule.

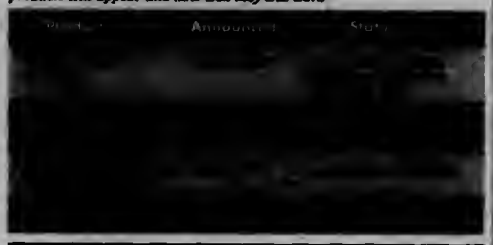
However, broad network interoperability remains an unfulfilled promise — one that many users and analysts do not expect to be delivered this year.

Novell appears likely to follow the lead of other computer companies that will "batten down the hatches" until the economy stabilizes, said Bill Lawrence, network engineer at Southern California Edison's nuclear power

Continued on page 47

Eyes on the calendar

Novell users have been watching to see when promised Netware 386 products will appear and how well they will work



CW Chart: Paul Mock

EC plans strategy for telecommunications

BY ELIZABETH DE BONY
IDG NEWS SERVICE

BRUSSELS — The European Commission plans to use 1991 and beyond to consolidate its two-pronged telecommunications policy approach of standard harmonization and market liberalization to create a vast European Community (EC) market.

To further this drive, the EC may provide details this year of plans to promote the creation of truly Europeanwide services and infrastructure — a so-called European nervous system.

Specifically, commission activities in 1991 will concentrate on follow-up directives to its framework open network provisions (ONP) directive as well as overseeing implementation of a satellite communication directive and possibly starting work on a strategy for the entire mobile telecommunications sector.

EC officials said an ONP committee of national experts will soon give the commission a draft text implementing ONP for leased lines. The EC's ONP directive, adopted in July, provides a framework of principles that must now be implemented by way of specific directives for each liberated service containing the appropriate standards. The ONP framework established the principle that all operators had access to public networks provided they respected specific standards. However, the directive allows member states to subject access to a transparent and nondiscriminatory licensing system that has won prior commission approval.

After further study, Filippo Maria Pandolfi, EC's research and development commissioner, said more discussions regarding ONP were in order. Those ended in December, and EC officials said draft directives will start surfacing by April. The directives will cover ONP for the sector, mutual recognition of licensing authorizations and a revised directive on the Mac-Packet of standards for high-definition television (HDTV). The existing EC directive on HDTV expires at the end of 1991.

Pandolfi also emphasized the need to work harder on standardization. Taking his cue from the commission's October Green Paper on Standardization, he has called for an acceleration of the European standardization drive. The paper called for a speeding up of the process by way of greater industry involvement and a transfer of responsibility for drafting standards from national standards institutes to a network of European institutions headed by a standards council.

Commission proposals to implement these objectives are expected in 1991. In the field of mobile communications, an EC official said the commission has

Continued on page 46

Microcom links worlds

BY JOANIE M. WEXLER
CW STAFF

HAMMOND, Ind. — Just a few years ago, Inland Steel Co. computer users swiveled between two terminals on their desks to access the notoriously discordant worlds of the IBM mainframe and the Digital Equipment Corp. minicomputer.

Today, 35 token-ring local-area networks later, 2,100 personal computers have replaced the terminals, and users are tapping into both environments from one desktop device. Part of that networking scenario now includes a recent addition to the Microcom, Inc. Relay Gold product line, a move that allows the financially faltering Microcom to compete with several other companies in the growing LAN-to-mainframe market.

Inland Steel has been beta-testing the Relay Token-Ring Gateway for six months and is now in the purchasing phase, according to Edward Saymoniak, account manager for the company's computer task group.

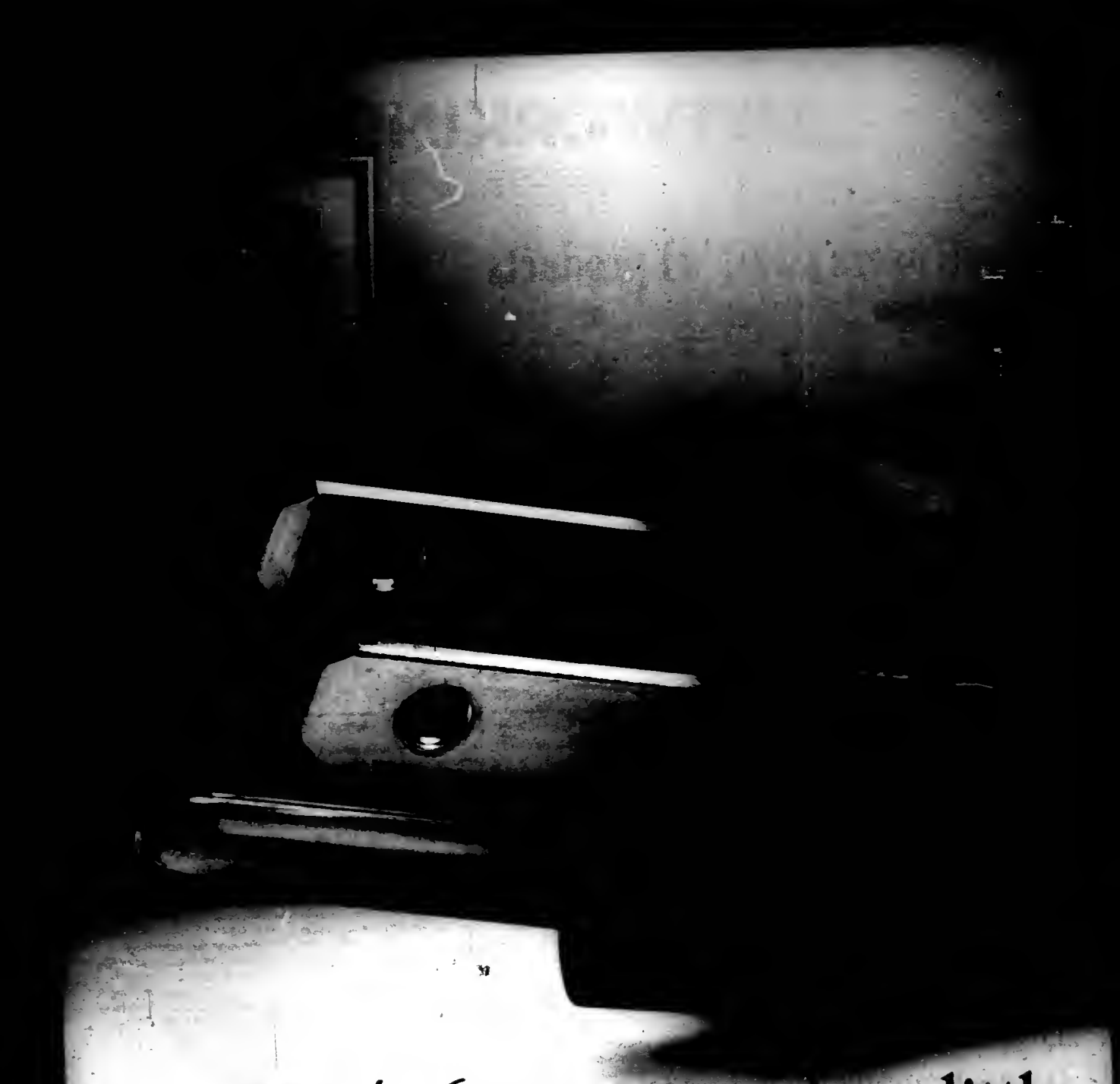
Microcom announced the token-ring product, along with Relay Synchronous Data Link Control Dial-Up, last month, as well as Relay/Transfer for Customer Information Control System, a mainframe software package.

Advantageous addition

Saymoniak said his company derives two main benefits from the Microcom token-ring offering. The first is using just one software package to handle connectivity for the networks, dial-up modems and coaxial controller boards. "I can bring up mainframe, [DEC] VAX and printer sessions, dial out over modems and download files simultaneously," Saymoniak said.

The second advantage is the product's automatic log-on capability. The feature allows an expert to write a script — or macro — that hooks a user into a host without having to provide an identification code and password to the remote system.

Microcom acquired the Relay line when it purchased VM Personal Computing, Inc. in Danbury, Conn., two years ago. Microcom is bringing its industry-renowned data compression techniques to the table with a high-speed proprietary protocol called Relay Transfer, which can be substituted for IBM's IND$ File — a program running on the IBM mainframe to handle the host side of a file transfer.



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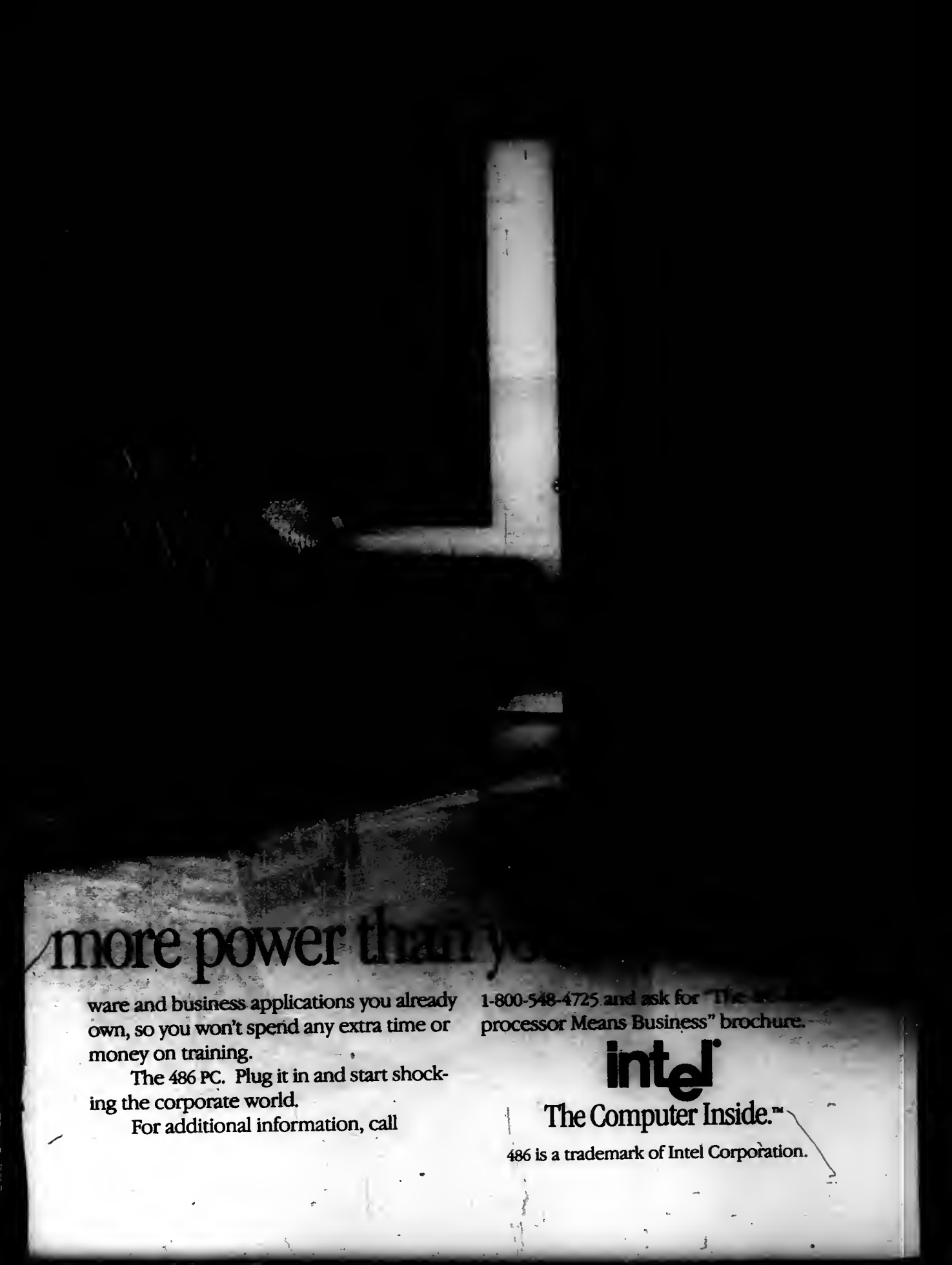
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EDI growth may be leveling off

BY JIM NASH
CW STAFF

Steam leaking from the slowly chugging electronic data interchange (EDI) locomotive could bring expansion of the technology to a halt before mid-decade.

While EDI proponents continue to advocate the universality of EDI, a new study indicates that the number of newcomers to EDI may have already peaked. That same study projects user spending on EDI services and equipment to grow at a 19% compound annual growth rate during the next four years.

Input, a market research firm in Mountain View, Calif., has published a report stating that the number of businesses plugging into EDI this year will hold to 5,000, the same number as last year.

"I think we are going to see a steady growth — not an exponential growth — over the next two years," Input consultant Torrey Byles said. The number of transactions conducted on EDI, however, is expected to grow at an exponential rate indefinitely, according to Byles.

"This has caused a stir," Byles said, "but we also got some positive feedback from vendors who said our past forecasts were a little [optimistic]." Without naming the companies, he said they agreed that this estimate appears to be more accurate.

Golden business rule

A basic business maxim known as the 80/20 rule explains why the growth in new EDI users is likely to level off and then taper off from its current high point, Byles said. According to the rule, 20% of an average company's trading partners are responsible for generating 80% of its business. He explained that companies typically use the 80/20 rule in deciding which partners should be linked via EDI.

The report indicates that because EDI is most cost-efficient for high-volume transactions, it is likely to remain a technology used primarily by the country's 1,000 largest companies, imposed on the 20% of their partners they consider key.

"As soon as we start hitting 35,000 users in the U.S. — maybe in about three years — we're going to see a slowdown [in newcomers]," he said. Input estimated that 20,000 companies now use EDI.

Donna Mog, systems designer at Revco Drug Stores, Inc. in Twinsburg, Ohio, disagreed, saying a new surge of users will come as the last of the major corporations climb aboard. Mog added she thinks a second wave will crest when EDI software and equipment become affordable for medium and small businesses.

That may be hopeful thinking. With about $2.5 billion in sales, Revco has five partners linked by EDI and another four in training. The company is operating under Chapter 11 protection, and like many companies, may be looking for significant savings through automated paperwork.

"There was a hell of a lot of infatuation with information processing in the '80s," which Byles said explains the overly optimistic predictions of replacing paper in most transactions. "But people aren't sure the investment has paid off," he said.

High-volume choice

While Byles admitted the chances of a surge among small businesses increase as technology gets less dear, he said he does not see that happening. "EDI is not cost-efficient to have when you only get a handful of orders in a month. It is competing with cheaper forms of order processing, such as phone orders, paper-based orders and walk-in orders."

"My gut feeling is that that is a little pessimistic," said Bill Nelson, senior director of network services at the National Automated Clearing House Association. "The market is so big," he added. Nelson said he sees the market hitting a plateau in "six or seven years."

Automated clearinghouses process electronic payments and debits under $100 million in much the same way Federal Reserve System clearinghouses process paper transactions. "We know that there are 100,000 companies using automated clearinghouses; not all are EDI," Nelson said. He added most of those firms would be candidates for EDI if the price were right. Input has offered annual assessments of the EDI market for the past four years. Byles explained that the company polled about 100 users, 30 trade associations and several EDI vendors.

EC strategy

CONTINUED FROM PAGE 43

issued standards legislation regulating cellular communications that will come into force by the end of 1991, rules establishing a harmonized pan-European paging system that takes effect at the end of December 1992 and plans to introduce common standards for digital cordless telephones by late 1992.

The commission is also expected to continue work on the development of advanced communication networks and integrated broadband communications.

The commission has identified telecommunications investments in Central and Eastern Europe as a priority because telecommunications is seen as key to bringing those regions' economies and business practices up to current EC and U.S. standards.

De Bony is a Brussels-based correspondent for the IDG News Service.

Unisys InfoImage Solutions. Take

Protocol to benefit remote LAN users

BY ELISABETH HORWITT*
CW STAFF

A de facto networking standard now coming into its own should help users access full local-area network services from a remote LAN or workstation.

Point-to-Point Protocol (PPP) was developed by the Internet Engineering Task Force to meet two important demands for the growing population of remote LAN users. First, it allows users to access the full range of LAN services such as file transfer, electronic mail and multiple server sessions over a dial-up line. This is of particular benefit to users — at home or on the road — who cannot justify a dedicated link to their office LAN. Without PPP or its equivalent, these users are limited to simple terminal-to-host access, said Jeff Fritz, a telecommunications engineer at West Virginia University.

An existing protocol called Serial Line Internet Protocol (SLIP) also allows users to access those LAN services over dial-up links. However, user-to-LAN communications via SLIP tend to be frustratingly slow because the protocol "takes up a lot of bandwidth and, in our experience, has lots of overhead," Fritz said. While vendors have avoided this problem by adding compression software to their SLIP products, PPP is said to have header compression built-in.

PPP also gives a remote workstation the ability to "negotiate" aspects of dialing into a LAN, including the following:

- Assignment of an address on the network by the LAN server. This is particularly applicable when the user is traveling and must request a new address to log onto the network.
- An identification number or password that will provide the user with access to restricted data or services.
- Compression of various fields defined by the protocol to cut overhead.

Widespread user and vendor implementation of PPP would help Merit Network, Inc. in Ann Arbor, Mich., in its administration of Michnet, system research programmer Glenn McGregor said. The network links users and computing resources at a number of academic, commercial and government centers.

Merit hopes to see enough user and vendor support of PPP to warrant replacing current SLIP installations with the newer protocol, McGregor said. PPP's support of password negotiation over dial-up lines will come in handy when Merit finishes implementing an identification system, he added. For example, the right identification will get a user beyond Michnet to Internet.

Also of value to Merit is PPP's ability to support multiple protocols, such as Transmission Control Protocol/Internet Protocol (TCP/IP) and Digital Equipment Corp.'s Decnet, over the same line, McGregor said. While Michnet has been testing PPP on TCP/IP systems to start with, the aim is to interconnect sites using Decnet, Open Systems Interconnect and Novell, Inc.'s IPX as well.

Compatibility a plus

The other major benefit PPP promises is interoperability between different vendors' routers. This could be very beneficial to companies that mix and match various brands of bridges and routers or wish to interconnect with business partners that use different types of equipment.

Menlo Park, Calif., router vendor Cisco Systems, Inc. claimed to have started shipping products with PPP support several months ago, while Wellfleet Communications, Inc. in Bedford, Mass., promised PPP support on all its interconnectivity products by the end of the second quarter. Other major router vendors either support PPP now or have announced their intentions to do so in the near future, McGregor said.

More recently, FTP Software, Inc. in Wakefield, Mass., announced a PPP version of its flagship TCP/IP software package for DOS-based personal computers.

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Novell

CONTINUED FROM PAGE 43

generation department in Irvine.

That may leave more interoperability projects lower on Novell's priority lists, Lawrence said. Burton said it would be a mistake for the company to delay "interoperability products [that it was] talking about in 1984 and 1985." It is "absolutely essential that Netware 386 interoperate with Network File System, Appletalk filing protocol and system messaging block," Burton said.

Lawrence said one of the products he would settle for this year would be a naming service that goes beyond the version recently released. The present release is limited in several ways, particularly in its lack of automation.

Sheldon Laube, national director of information and technology at Price Waterhouse, said he expects little in the way of network management from Novell this year. Laube said users are getting impatient waiting for tools that allow them "to see exactly what's going on in all the other Netware 386 servers around the wide-area network."

NEW PRODUCTS

Local-area networking hardware

National Semiconductor Corp.'s Computer Enhancement Group has introduced three adapter cards designed to connect Apple Computer, Inc.'s Macintosh systems to 10Base-T Ethernet local-area networks.

The boards incorporate connectors for thick coaxial and twisted-pair Ethernet cables and feature drivers that are compatible with Apple's Ethernet protocol, Ethertalk.

Prices range from $449 to $595.

National Semiconductor
2900 Semiconductor Drive
Santa Clara, Calif. 95052
(408) 721-2650

Diamond Micro Solutions has announced the Rocket 486/33 Model 433, an Intel Corp. I486-based 33-MHz Extended Industry Standard Architecture tower system designed to support Novell, Inc.'s Netware, The Santa Cruz Operation's Unix and Xenix, PC-DOS, MS-DOS and other major operating systems and software.

A basic configuration includes 8M bytes of random-access memory, a 1.2M-byte floppy disk drive, two serial ports, a parallel port and DOS Version 3.3 or 4.01.

The product is priced at $5,599.

Diamond Micro Solutions
1615 Alvarado St.
San Leandro, Calif. 94577
(415) 351-4700

Customer-premises equipment

Digital Link Corp. has announced a product that serves as a T3 multiplexer and data service unit and combines multiple data terminal equipment inputs onto a single 45M bit/sec. T3 line.

The DL3000 digital signal multiplexer can be programmed to accept data at speeds ranging from 300K bit/sec. to 44.2M bit/sec.

It can accept data from data terminal equipment such as local-area network bridges or routers, private branch exchanges or videoteleconferencing equipment.

Pricing starts at less than $15,000.

Digital Link
252 Humboldt Court
Sunnyvale, Calif. 94089
(408) 745-6200

Gandalf Data, Inc. has announced a Basic Rate Interface TA-1 terminal adapter that is compatible with AT&T or Northern Telecom, Inc. Integrated Services Digital Network central-office switches.

The product features an RS-366 autocall interface that allows users to dial automatically via one or both B channels.

The product is priced at $1,095.

Gandalf Data
1020 S. Noel Ave.
Wheeling, Ill. 60090
(708) 541-6060

Electronic mail

Biscom, Inc. has announced a communications software package designed to allow users of Wang Laboratories, Inc. VS systems to send word processing and other documents to facsimile machines.

Faxcom for VS is a fax server that features Faxcom Communication Language, a command set that allows programmers to control the intelligence and capabilities of the fax server. Faxes can also be scheduled to be sent after business hours, the vendor said.

The product costs $7,500.

Biscom
85 Rangeway Road
Billerica, Mass. 01821
(508) 670-5521

Host-to-host

Joiner Associates, Inc. has announced a line of software products designed to implement IBM's Network Job Entry protocols on Digital Equipment Corp. VAX/VMS systems.

Version 3.5 of the Jnet family features multiple transmission streams, a documented application programming interface and Vaxcluster transparency.

The new releases are scheduled to begin customer testing this month, according to the vendor.

Pricing ranges from $1,125 to $51,375 for Jnet Clusterwide licenses. Other versions cost $6,000 per node.

Joiner Associates
3800 Regent St.
Madison, Wis. 53705
(608) 238-8637

Micro Technology, Inc. has announced a computer interconnect product designed for Digital Equipment Corp.'s VAX 3000/4000 series and Microvax II machines.

The CIQBA provides VAX system users with a direct connection to a computer interconnect-based Vaxcluster, the vendor said.

The product is slated to begin shipping in the first quarter of 1991. Pricing ranges between $9,500 for Microvax II systems and $18,500 for VAX machines.

Micro Technology
5065 E. Hunter Ave.
Anaheim, Calif. 92807
(714) 970-0300

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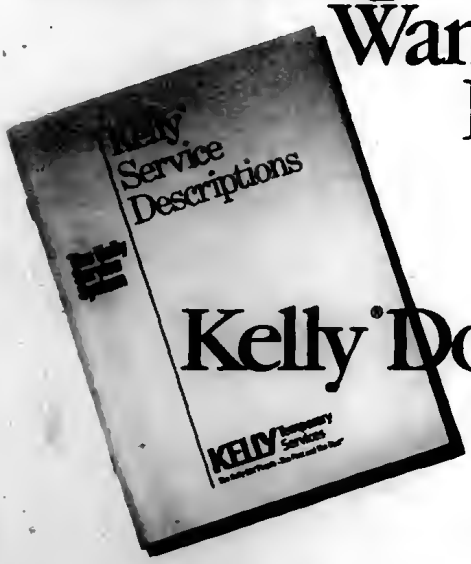

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MANAGER'S JOURNAL

EXECUTIVE TRACK

J. Raymond Caron, president of Cigna Corp.'s information systems subsidiary Cigna Systems, has been elected to **The Conference Board's Council of North American Information Management Executives.**

Founded in 1985, the council consists of prominent IS executives in the U.S. and Canada. Members meet three times per year to discuss issues, problems and solutions of common interest and to plan research among members on leading-edge issues.

The New York-based Conference Board is a worldwide business network connecting companies and senior executives from more than 50 countries.

Caron was promoted to his current job at Cigna in 1988. He is responsible for all systems development, data processing and telecommunications functions at Philadelphia-based Cigna. He joined Insurance Company of North America, a Cigna firm, in 1973 as a systems analyst.

.....

Jeff Wolf has been named vice president and controller at **Link Technologies, Inc.**, a computer terminals supplier in Fremont, Calif. He is responsible for MIS, finance, accounting and legal functions.

Wolf, 39, was most recently responsible for financial planning and analysis at Wyse Technology, which acquired Link Technologies in 1987. He previously held financial positions at Worlds of Wonder, Inc. and Zilog, Inc.

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Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Downsizing now behind Hartford

Having achieved its IS staffing goal before the recession, The Hartford looks ahead

BY SALLY CUSACK
CW STAFF

In the wake of a national economic downturn and a recent wave of industry consolidation, insurance companies have been moving for some time to downsize operations and restructure products and services. ITT Hartford, namesake of the Connecticut insurance capital that serves as its corporate headquarters, is no exception.

"We had never had a major layoff since our founding in 1810," says John T. Crawford, vice president of information management at The Hartford. "When the first wave came in January 1987, it was a shock, particularly to the employees in information systems."

Cutting back is never easy, but The Hartford has one consolation: While other companies must look ahead to belt-tightening in IS during the coming year, The Hartford can look back on already having achieved it. The firm had 2,250 people on its information management payroll in 1985 and finished out 1990 with approximately 1,700.

"It's difficult to manage a downsizing," Crawford reflects. "The first 25 years in this business, I was always trying to find people to grow the organization bigger and bigger. I had no experience with downsizing."

According to Crawford, The Hartford's goal was to define plans for a cutback by the fall of 1987. Crawford deployed a reduction in force group, which was made up of IS senior management and a handful of staff members, to develop a strategy that included the following:

- Implementation of a corporate early retirement program to provide incentive for some employees to leave voluntarily.
- A freeze on all hiring.
- A calculation of what the company could expect to lose through normal attrition, which was about 8% annually.

The Hartford's Crawford *now runs a leaner IS function*

Crawford outlined several objectives for the downsizing effort, among them a thorough review of every job in the IS organization, a commitment to protect discretionary funds for research and development investment and a mandate to minimize arbitrary resource allocation to avoid across-the-board cuts.

"We wanted to use the crisis to strengthen the management team," Crawford says. "My direct reports worked together to fashion the organization they would drive." Management goals included the fair treatment of all individuals and an effort to minimize organizational disruption.

"One of the things we learned after the first wave of cutbacks was that we had to do a better job of communicating with our employees," Crawford says.

The first step in that direction was to create a quarterly newsletter for the information management community. The publication actively solicits contributions and ideas from employees as well as provides a communication vehicle for upper management.

Continued on page 50

Sun R&M pleased with outsourcing results

BY CLINTON WILDER
CW STAFF

Just short of four months have passed since Sun Refining & Marketing Co. outsourced its data center to Andersen Consulting. From Sun's perspective, the verdict is so far, so good.

Sun's plan to save up to 35% on its annual processing costs during the 10-year contract is proceeding smoothly, said Jack Donohue, vice president of information systems at Sun. His bosses think so, too. On a wall in his corner office overlooking downtown Philadelphia, Donohue displays the third-quarter 1990 "Best of the Best" award from Sun's president for managing the outsourcing decision.

"In four months, we haven't skipped a beat," Donohue said. All 70 employees at Sun's Dallas data center accepted job offers from Andersen.

However, Donohue is quick to say that he does not believe outsourcing is right for every company. Sun's IS department had several circumstances that made outsourcing to Andersen the right choice, according to Donohue.

Sun's *Donohue: Outsourcing works*

First and foremost, the Dallas data center had excess CPU capacity, making it attractive for Andersen to acquire and less attractive for Sun to keep. Sun no longer handled mainframe processing for its exploration and production company, which it spun off as Oryx Energy Co. in 1988. "Now Andersen gets the economies of scale that we used to have when we were a bigger company," which creates the savings in processing costs, Donohue said.

He stressed that outsourcing presents a huge management challenge to Sun. "This wasn't something to be delegated. We had our top people on it," he said.

Donohue also noted the proliferation of personal computer and local-area network-based applications at Sun. "We built our whole philosophy in the 1970s and 1980s around the data center, but now the real action is on the desktops," he said. "The data center is still important, but it's not strategic."

Still, Donohue concluded, "We wouldn't have done it if there wasn't a financial carrot."

Downsizing

CONTINUED FROM PAGE 49

In addition to the newsletter, Crawford has also initiated regular, ad hoc group meetings in which people are randomly selected to voice their ideas and concerns. These two-hour meetings are held on a bimonthly basis.

According to Robert R. Lukas, The Hartford's assistant vice president of information services, employees are becoming more comfortable with the idea of speaking frankly to upper management.

"Of course, there are still, and always will be, some skeptics," Lukas says. "If you tell them 60 positions will be eliminated, they'll believe 600. In general, though, I think people feel like they're on safer ice than they were a few years ago."

Crawford is not listening with an "ivory tower" perspective. He has held practically every type of position in IS: computer operator, programmer, systems analyst and program manager. He joined The Hartford in 1980 as an assistant vice president.

"With 1,700 people, I find it both essential and exciting to hear what they have to say," Crawford says, adding that he agrees up front to absolute confidentiality, regardless of what topic or problem the employee wishes to discuss.

The Information Management Division at The Hartford is perhaps a bit more complex than the average IS shop, as it is responsible for servicing the company's two disparate businesses: life insurance and property and casualty insurance.

Crawford reports to both company presidents, which gives him two sets of customers with two very different sets of needs, but he says he feels a centralized technology group provides for a strong working relationship with both firms.

The Hartford's data center has gone through some downsizing itself, from 20 mainframes in 1987 to eight in 1990. The Hartford relies on a combination of systems from Amdahl Corp. and IBM for mainframe processing. For claims processing, the life insurance side of the house has chosen Digital Equipment Corp. machines, while the property and casualty company has installed Wang Laboratories, Inc. midrange systems.

The Hartford is in the process of piloting an imaging system from Wang to fully automate the claims process.

Keeping informed is paramount for Crawford, and while logging in 55 to 60 working hours per week, he makes frequent use of his cellular car telephone and voice-mail technology when he is not actually in the office. An avid reader, he is famous for clipping technology- and management-related articles from newspapers and magazines and regularly sending them to appropriate staff members.

Better off than most

Crawford says he believes The Hartford is in a better position than most of its competitors because of conservative underwriting practices and investment policies. The Hartford boasts a solid balance sheet and remains free of junk bonds and real-estate speculation.

Although business growth is slow — total assets increased just 2% in 1989, to $8.69 billion — Crawford says he believes The Hartford is luckier than some corporations in that it did not wait for a total crisis situation before taking the necessary reorganizational measures.

Crawford is the first to acknowledge there is no magic. It basically comes down to hard work. Although his workday has been intensified during the past few years, he enjoys the challenges and opportunities as they arise.

"The world is exploding with new technologies, and it's exciting to explore what business opportunities they provide," Crawford says. "When we get past this current down cycle — and we will get past it — we will be back in a position to grow. One of my goals is to be a catalyst for the company in terms of trying to excite people about exploring new technologies for growth."

Recycled employees

In addition to a distributing quarterly newsletter for IS staff members and holding employee meetings, John T. Crawford has also recently participated in making a video to address employee concerns at The Hartford.

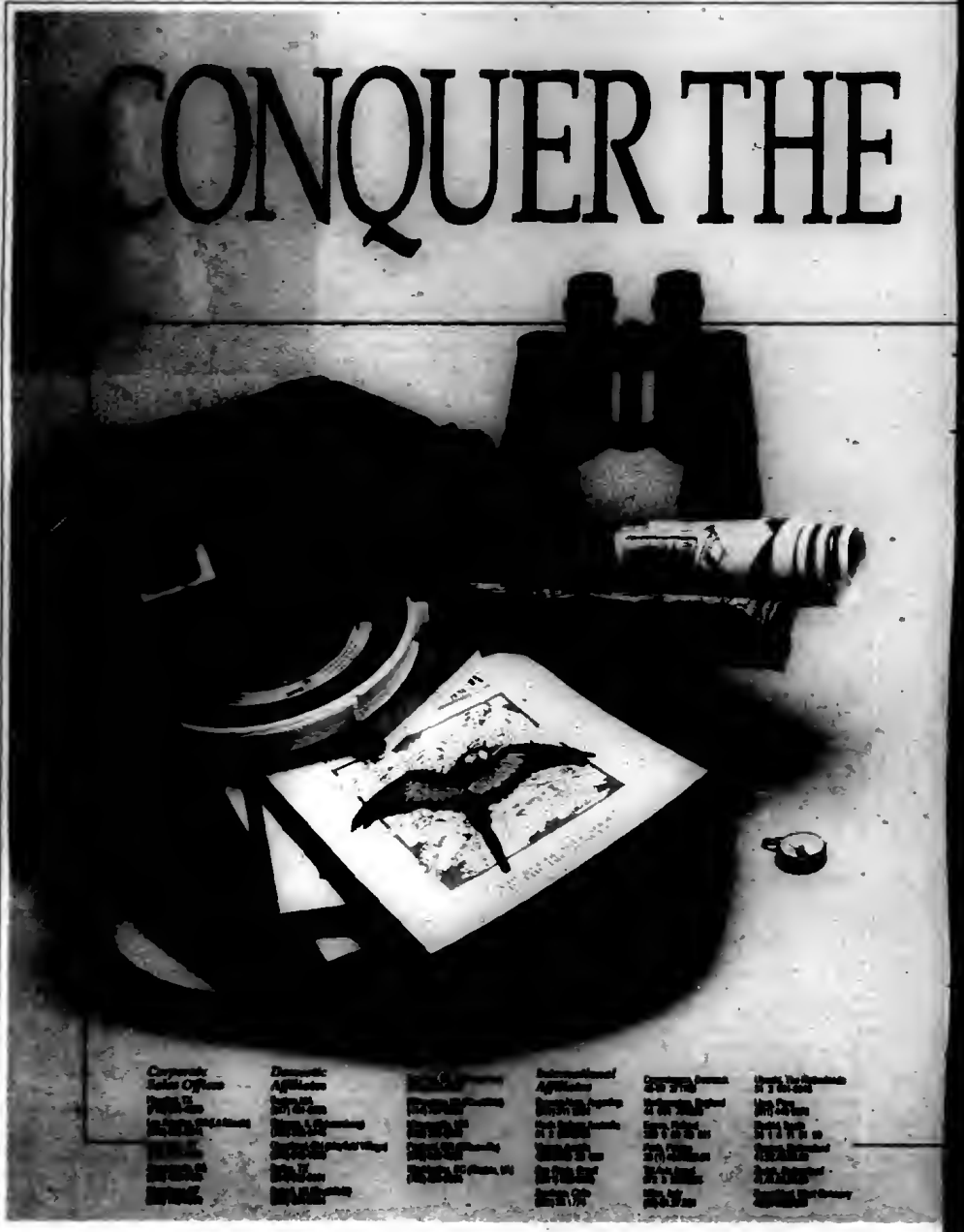
One of the main topics in addressing employee questions on job retraining opportunities and how those opportunities can meet employee needs in the future.

This all falls into Crawford's definition of aggressive staff planning. By working with senior staff members to map out job skills and positions, the firm can target new areas where special skills are needed.

"This means that as people's jobs are eliminated, we can implement a retraining program using job counseling and testing to retrain them for employment in another area of information services," he says.

The Hartford has retrained approximately 80 people during the past two years — all employees whose traditional jobs in IS had been eliminated.

SALLY CUSACK



CLIPS

Tim Lewis

Summaries from leading scientific and management journals

"System project failure: The heuristics of risk"

By David McComb and Jill Smith
Journal of Information Systems Management

Winter 1991

■ Almost every information systems manager has experienced systems development projects that fail to meet deadlines or live up to user expectations. Some of the risk involved in development efforts can be eliminated through careful examination of the factors common to most failures.

The following are among the risks:

- Gross underestimation of the time required to complete the project. To avoid this problem, include as much detail as possible in the original estimate.
- Bid strategy. The automatic selection of the lowest bidder as vendor is usually a prescription for failure. The productivity of a better-quality candidate may be as much as 10 times higher.
- Lack of user involvement. End users will more eagerly adopt a systems project if they are involved in its development and if its implementation will offer them tangible benefits.
- Workarounds. It is better to confront a problem directly than to expend a great deal of effort or make design compromises in working around the obstacle.
- Experimentation with new technology. Exercise caution in installing unproven products. — Derek Slater

"The new quality landscape: Total quality management"

By Lawrence Tobin
Journal of Systems Management

November 1990

■ The latest buzzword in business, total quality management (TQM), is defined as an integrated effort to continuously improve every business process and strive for the goal of 100% satisfied customers. But what does TQM mean to the information systems function?

For one thing, it will not be enough for IS to deliver defect-free systems that meet user requirements. The IS department will have to look beyond its internal users and consider whether the system is "doing the right thing" for the business' customers as well.

Corporate executives embracing TQM will also be ordering a whole new set of information systems to capture and analyze data about customers and the quality of products and services. Because TQM projects are typically handled by multidisciplinary teams, there will be an even greater emphasis on networking across functional lines.

TQM can also be adopted by the IS department, empowering IS staff members to seek improvements in their processes. But the big payoff is that TQM gives IS an opportunity to play a role in how the corporation does business, as opposed to being isolated from the greater business environment. — Mitch Betts

"Why change programs don't produce change"

By Michael Beer, Russell Eisenstat and Bert Spector
Harvard Business Review

November/December 1990

■ A whirlwind of changing markets and sleeker competition is enough to make a firm reevaluate and refocus its strategies. The problem is that senior managers have waited for mission statements and highly structured training programs to filter down through the ranks.

However, managers should do just the opposite: They need to involve their workers in all facets of change. Rather than concentrating on formal structures, they should be creating ad hoc organizational arrangements to solve business problems. This focuses the change on the work, not the structure.

There are six steps companies can take to ensure effective change:

Step 1: Mobilize commitment to change by forming a shared diagnosis throughout the company of what the business problem is.

Step 2: Develop a shared vision of how to organize and manage for competitiveness.

Step 3: Foster consensus for the new vision, competence to enact it and cohesion to move it along.

Step 4: Spread revitalization to departments without pushing from the top.

Step 5: Institutionalize revitalization through formal policies, systems and structures.

Step 6: Monitor and adjust strategies in response to problems in the revitalization process. — Cathy Duffy

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CALENDAR

The perspectives on information technology of four chief executive officers will highlight Nolan Norton Institute's annual symposium in Tarpon Springs, Fla., Feb. 7-8.

Entitled "The Enterprise of the Future — Today," the event features speeches by the CEOs of Sea-Land Service, Inc.; Wrangler, Inc.; Thorn-EMI PLC in the UK; and Federconsorzi in Italy. More than 20 breakout sessions will feature case studies in information technology application at corporations and government agencies. The keynote speaker is scheduled to be author and futurist Alvin Toffler.

For more information, contact Lois Chase at Nolan, Norton & Co., One Cranberry Hill, Lexington, Mass. 02173 (617) 862-8820.

FEB 10 - 16

The Development Center Institute Conference. Orlando, Fla., Feb. 10-13 — Contact: Development Center Institute, Indianapolis, Ind. (317) 846-2753.

Video Expo. San Francisco, Feb. 11-15 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Managing Information Technology When the Going Gets Tough. London, Feb. 12 — Contact: Sary Mayhew, London, England (071) 236-4080.

Frame Relay for LAN/WAN Internetworking. Washington, D.C., Feb. 12-13 — Contact: Telestrategies, McLean, Va. (703) 734-7050.

Networld '91. Boston, Feb. 12-14 — Contact: Annie Z. Scully, Bruno Blenheim, Englewood Cliffs, N.J. (201) 569-8542.

Infocomm. Orlando, Fla., Feb. 12-17 — Contact: The International Communications Industries Association, Fairfax, Va. (703) 273-7200.

Systems Leadership. Los Angeles, Feb. 13-15 — Contact: Mette Shillings, Index Group, Inc., Cambridge, Mass. (617) 499-1874.

FEB 17 - 23

SAS Users Group International Conference. New Orleans, Feb. 17-20 — Contact: SUGI Registration, SAS Institute, Cary, N.C. (919) 677-8000.

Northwest Computer Show. Minneapolis, Feb. 19-20 — Contact: Judy Koch, Plymouth, Minn. (612) 420-5376.

C++ for C Programmers. Los Angeles, Feb. 19-22 — Contact: Short Course Program Office, UCLA Extension, Los Angeles, Calif. (213) 825-3344.

Trax User Group Conference. Long Beach, Calif., Feb. 19-22 — Contact: Anne Sifferman or F. Thomas Cox, Trax Softworks, Culver City, Calif. (213) 649-5800.

Planning and Selecting a Financial Information System. Louisville, Ky., Feb. 20 — Contact: Beth Daly, University Seminar Center, Boston, Mass. (617) 248-8085.

Image Scanning Conference. Monterey, Calif., Feb. 20-22 — Contact: BIS CAP International, Norwell, Mass. (617) 982-9500.

Multimedia '91. Orlando, Fla., Feb. 20-22 — Contact: Society for Applied Learning Technology, Warrenton, Va. (703) 347-0055.

FEB 24 - MARCH 2

Computer Associates International's VSE/ESA Educational Workshop. New Orleans, Feb. 24-26 — Contact: George Janetakis, Computer Associates, Garden City, N.Y. (516) 227-3300.

Communications Connections '91. San Diego, Feb. 24-27 — Contact: Dimensions, Redwood City, Calif. (415) 637-2300.

IEEE Conference on Artificial Intelligence Applications. Miami Beach, Feb. 24-28 — Contact: IEEE Computer Society, Washington, D.C. (202) 371-1013.

Share 76. San Francisco, Feb. 24 - March 1 — Contact: Share Headquarters, Chicago, Ill. (312) 644-6610.

The State of The Practice/The State of the Art CASE Conference. Orlando, Fla., Feb. 25-27 — Contact: Extended Intelligence, Chicago, Ill. (312) 346-7090.

Sun Open Systems Expo. Boston, Feb. 25-27 — Contact: Sun Open Systems Expo, Austin, Texas (512) 331-7761.

Compcon Spring '91. San Francisco, Feb. 25 - March 1 — Contact: Roger Anderson, Livermore, Calif. (415) 422-8572.

SAE International Congress and Exposition. Detroit, Feb. 25 - March 1 — Contact: EDI, Inc., Ann Arbor, Mich. (313) 995-2840.

EDI and the Law '91. Washington, D.C., Feb. 26-27 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 548-7005.

European Wireless Systems Conference. Munich, Germany, Feb. 26-27 — Contact: Rita A. Tannenbaum, Probe Research, Cedar Knolls, N.J. (201) 285-1500.

Financial Market Data Conference. New York, Feb. 26-27 — Contact: Waters Information Services, Binghamton, N.Y. (607) 772-8086.

Working with Personal Computer Local-Area Networks. Milwaukee, Feb. 26-28 — Contact: John T. Snedeker, Center for Continuing Engineering Education, University of Wisconsin at Milwaukee, Milwaukee, Wis. (414) 227-3101.

The Restructuring and Outsourcing Conference. Orlando, Fla., Feb. 27-28 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Strategic Planning Systems Conference. Tempe, Ariz., Feb. 27 - March 1 — Contact: Pete Ashey, Conference Coordinator, Nardoni Associates, Lebanon, N.J., (201) 730-9444.

MARCH 3 - 9

Seybold Seminars. Boston, March 4-7 — Contact: Seybold Seminars, Malibu, Calif. (213) 457-5850.

IS Performance/Capacity Management Conference. Mesa, Ariz., March 4-8 — Contact: Applied Computer Research, Phoenix, Ariz. (602) 995-5929.

ACM's Computer Science Conference. San Antonio, March 5-7 — Contact: Dan Nowak, Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Technomnet. San Francisco, March 5-7 — Contact: Technomnet, Austin, Texas (512) 343-9066.

Windows and OS/2 Conference. San Jose, Calif., March 5-7 — Contact: CM Ventures, Emeryville, Calif. (415) 601-6000.

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When the everyday turns treacherous

BY BARBARA FRANCETT

The most exotic network problems aren't always the hardest to tame. Often, the worst headaches for network managers result not from wrestling with nature or geography but from extreme versions of garden-variety phenomena, such as equipment diversity, rapid growth and poor documentation.

Just ask Andrew Maffei. As network manager at the Woods Hole Oceanographic Institute in Woods Hole, Mass., Maffei is responsible for communications from shipboard to a robot-manned deep-submergence laboratory on the ocean floor. Part of his network lies miles down in the frigid cold and high pressure of the deep-sea world.

As may be imagined, that kind of configuration presents very special challenges. The robots communicate with workstations and personal computers on shipboard two to six miles above via fiber-optic cable, a token-ring network using high-speed 80M-bit links and several 10M-bit channels and customized software from FTP Software, Inc. in Wakefield, Mass. The intense cold and high pressure requires the robots' computers to be housed in a titanium cylinder six inches in diameter. "We had to develop our own PC to fit inside that space," Maffei says. "To withstand the pressure, special cable has to be used for towing and to connect the robots."

However, projects like this aren't the ones that make Maffei shudder. "The real nightmare," he says, is onshore at the research facilities, "hooking together all the crazy stuff the scientists bring in."

Woods Hole researchers receive funding from various agencies and spend it on whatever equipment they deem most appropriate for their projects. "We try to set guidelines for connecting machines to the network, but we really don't have the authority," Maffei says.

Maffei says *deep-sea networking beats handling onshore users*

Among Woods Hole's 18 to 20 buildings on two campuses — which are 1½ miles apart — are 400 network connections and 800 to 900 users. Fiber-optic cable runs between buildings. The subnets within use varieties of Ethernet. "Everything is based on Transmission Control Protocol/Internet Protocol networking," Maffei says.

A complex mesh of bridges, routers and gateways maintains order among the network users, keeping some networks local and allowing access to others, as well as to four clustered Digital Equipment Corp. VAX hosts and a Convex Computer Corp. mini-supercomputer.

Documenting the diversity is top priority now, Maffei says. "We try to standardize the backbone as much as we can, but every local group doesn't have the same configuration," he says. "This makes it extremely difficult to provide services."

Operating in fast forward

At Blockbuster Entertainment Corp. in Fort Lauderdale, Fla., the corporate network staff also knows something about the troubles equipment diversity can cause. In its case, however, the culprit was not scientific individualism but rapid growth.

A year ago, Blockbuster had two Arcnet networks — one at its central information systems site in Dallas, supporting 15 to 20 people, and another at headquarters in Fort Lauderdale. Today, the Arcnets are gone, replaced by new cabling, a dozen token-rings and five Ethernets. These networks support more than 500 users, including personnel at zone offices in Fort Lauderdale, New York, Chicago, San Diego and Dallas. Microcom, Inc. bridges connect the token-rings and Ethernets, and a Novell, Inc. bridge links the two local-area network types.

Computer operations are split between Dallas and Fort Lauderdale. DEC VAXs in the zone offices poll the 1,500 stores, which retrieve film files and billing information processed by Decclusters in Dallas and Fort Lauderdale. Application System/400s in the headquarters locations perform finance and distribution applications.

Down more than up

Getting from then to now was a real struggle, says Rick King, manager of corporate networks. "We fought enormous problems with the existing cable — too many users and too many differences," he says. "We were fighting the network every day, with flaws in the cabling and too many hands in every change to the cabling. We were down more than we were up. Data was always corrupted."

Blockbuster operates in fast expansion mode, King says. "We go to a location and drop-ship a store into place, cookie cutter style. How do we develop the network to keep up with that entrepreneurial spirit? We absolutely have to be proactive when designing networks for maximum usage. With the right networks, we can handle dropping in new computers."

Getting those "right networks" in place was far from trouble-free, however. "When we put in the new cabling, we didn't get to move people out and start from scratch," King says. "We had to fight the existing gremlins while laying and testing new cabling. We migrated so fast, we migrated some problems into the new cabling.

"For instance, when we built the new wiring, we put a single outlet with four jacks into every office: one for the telephone, one for the token-ring, one for AS/400 terminals and one for DEC equipment. But we tried

Continued on page 54

INSIDE

Rules don't always apply
Page 55.

The stuff of nightmares
Page 56.

Francett is a free-lance writer based in Bloomfield, N.J.

Continued from page 53

to go so fast, we didn't label our work as we should have. We punched some telephones into the wrong jacks, so some telephone traffic mixed in with the data traffic. We document the network, but it changes so fast, it's hard to stay current," King explains.

The "game plan" is to give all users access to each other and any network they want to reach, King says. "The direction of the world is to use discrete networks and link them together, so we had to design a network that would do that. We're further out than we'd anticipated, but we're growing too fast to be slow."

It doesn't look as though the pace will slow. "My whole direction is to get a foothold and get out of the Dark Ages," King says. "Now we've brought the whole company into this network, although we're still clearing up some bugs. When everybody is capable of doing their work, then we can take a breath and upgrade."

The rocketing popularity of LANs represents a substantial threat to network performance and reliability. "Most networks aren't planned; they just happen," says Jeff Held, a partner in the network consulting practice of Ernst & Young in Fairfax, Va. "Users are having a very difficult time keeping track of what they have and what they've paid for what they have."

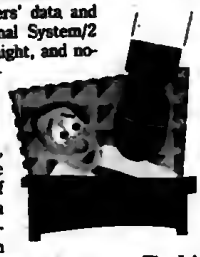
Trampled by demand

"Success is the most dangerous thing that can happen to a LAN," says Christopher Cleveland, a systems analyst at Arco Pipeline Co. in Independence, Kan. "Two years ago, we brought in our LAN, an IBM Token-Ring with gateways to an IBM 4381 host, to replace an IBM 5520 word processing machine with eight workstations and a Novell file server. Now it supports 500 people. Everybody wants to be on the LAN."

Network reliability suffered in the process. "Nine months ago, the LAN crashed 10 times a month. Sometimes it would crash three times in an afternoon," Cleveland says.

The cause of the crashes: Too many users at one time caused a phenomenon known as "jitter" that occurs when the upper end of the Token-Ring's user limit is approached, Cleveland explains. Switching from twisted-pair to IBM shielded twisted-pair cable extended by fiber-optic segments, as well as revamping the AC power to allow the computer system to have its own dedicated power sources, eliminated the problem.

"At the outset, we didn't know how big the network would get or what we'd use it for," Cleveland says. "The clue is to overbuild — go beyond your wildest imagination. Now we can plan downtimes. Recently, we moved 160 users' data and programs from one Personal System/2 Model 80 to another overnight, and nobody knew it. My boss is impressed," he adds.



Altering island culture

A 4,000-user population, 160 branches across three states and a diversity of businesses make building a new network at First National Bank of Maryland in Baltimore an extremely complex undertaking, according to William E. Spies II, who is the division vice president of telecommunications systems.

"This year, we're replacing 3270 workstations with PCs. We also have about a dozen LANs that were islands unto themselves," Spies says. "Now it's time to put diverse LANs together with the wide-area network, and that's easier said than done. We have over 4,000 internal users as well as clients of the Trust and Investments Division who use PCs to look up customer files and see account status."

The LANs will consist of Intel Corp. 80386-based PS/2-type machines as file servers and separate communications servers using a token-ring topology and software bridges. "We'll have a T1 backbone to IBM 3745 Model 130 front-end processors that interface to the host, an IBM 3090 Model 400," Spies says.

The backbone is a private, fiber-optic digital microwave network that uses T1 and T3 channels to connect the LANs. "Through the mainframe, we'll also have links to our DEC VAX 785 minis, AS/400s and Tandem Computers, Inc. Nonstop, so workstations can access those machines without going outside the LAN," Spies says.

The bank's geographic dispersion across Maryland, Delaware and Virginia creates an enormous network management problem. "We'll have systems administrators who aren't information

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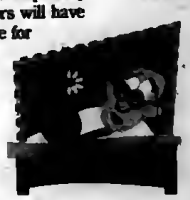
technologists on-site to manage portions of the network. "How can we guarantee the same level of service for all?" Spies asks. "We'll have a centralized help desk, but the systems administrators will have to solve problems at the scene for themselves. Centralized management isn't possible when you're spread over three states."



On the edge

Of course, despite the initial disclaimer, unique circumstances such as extreme distances and geographic isolation can produce some real network puzzlers. Consider, for example, the communications challenge faced by Pacific Machinery Co. in Waipahu, Hawaii, a Caterpillar, Inc. construction equipment dealer and marine engine supplier.

Pacific Machinery has stores on four of the Hawaiian islands and one in Guam — more than 3,000 miles away. The construction business on Guam has experienced a boom in the last couple of years, mostly as a result of an influx of Japanese tourists, says Roger Staehle, senior analyst at Pacific Machinery. Suddenly, the Guam store needed to communicate more data about inventory, accounting and service to the IBM System/38 in Waipahu.

The staff at the Guam store had been communicating and transmitting records in rudimentary fashion by phone, facsimile and written communiques. With the increase in business volume, it became clear that electronic transmission was badly needed, but until recently, no adequate data transmission medium existed.

In May, Staehle implemented a 56K bit/sec. fiber-optic line front-ended by a voice/data multiplexer from Republic Telcom Systems Corp. in Boulder, Colo., which provides voice channels and high-speed data circuits. "On the mainland, this kind of solution is more common," Staehle says, "but 56K-bit services haven't been available in Hawaii very long." Pacific Machinery's next challenge is to extend the link via satellite to Caterpillar headquarters in Peoria, Ill. ●

Breaking tradition

Sometimes, the best way to avoid network problems is to ignore conventional wisdom.

Consultants told Oregon Cutting Systems, Blunt Co. that its network plan was "too ambitious." However, according to telecommunications analyst Ed Nelson, the company was convinced that competition made the setup it envisioned "a strategic necessity."

So the Portland, Ore., manufacturer of cutting chains and bars for chain saws plunged ahead with construction of a 400-node network made up of four Ethernets and one token-ring, connecting users not only to the IBM 4381 mainframe and Application System/400s but also to its plant in Guelph, Ontario.

Nelson says the problems envisioned by the consultants never materialized. "Everything works and works great, with only a few minutes of downtime a month." This was achieved by a team Nelson says started with "zero expertise. It took us three weeks to figure out how to wire a connector."

How did they pull it off?

"Planning and testing is key," Nelson says. "We put a lot of time and effort into testing connections before adding them to the net." Guaranteeing ongoing accountability also helps, he adds. One aid to achieving this is a diagnostic tool, the Sniffer analyzer from Network General Corp. Another is a "simple but good documentation process," which Nelson says makes it possible to "trace any location in the company in 10 minutes by the way we identify our nodes."

At First Boston Corp. in New York, Morty Eisen, manager of voice and data engineering, also broke tradition when implementing First Boston's backbone network.

"Historically, we had tried to standardize on the token-ring, but for application development, we wanted a Unix platform," Eisen says. The outcome was an inverted backbone that currently supports more than 270 users on a combination of token-ring and Ethernet subnetworks with connectivity to a data center in Princeton, N.J.

Eisen also says he has chosen to focus more attention on the physical layers of the network. "The philosophy we've employed goes against the industry trend. We've taken transmission people and cross-trained them on local-area network communications, focusing on cabling, bridging and routing — the physical connections," Eisen says. "On our preceding LANs, a lot of problems were blamed on the network, but most of the time they weren't there."

BARBARA FRANCETT

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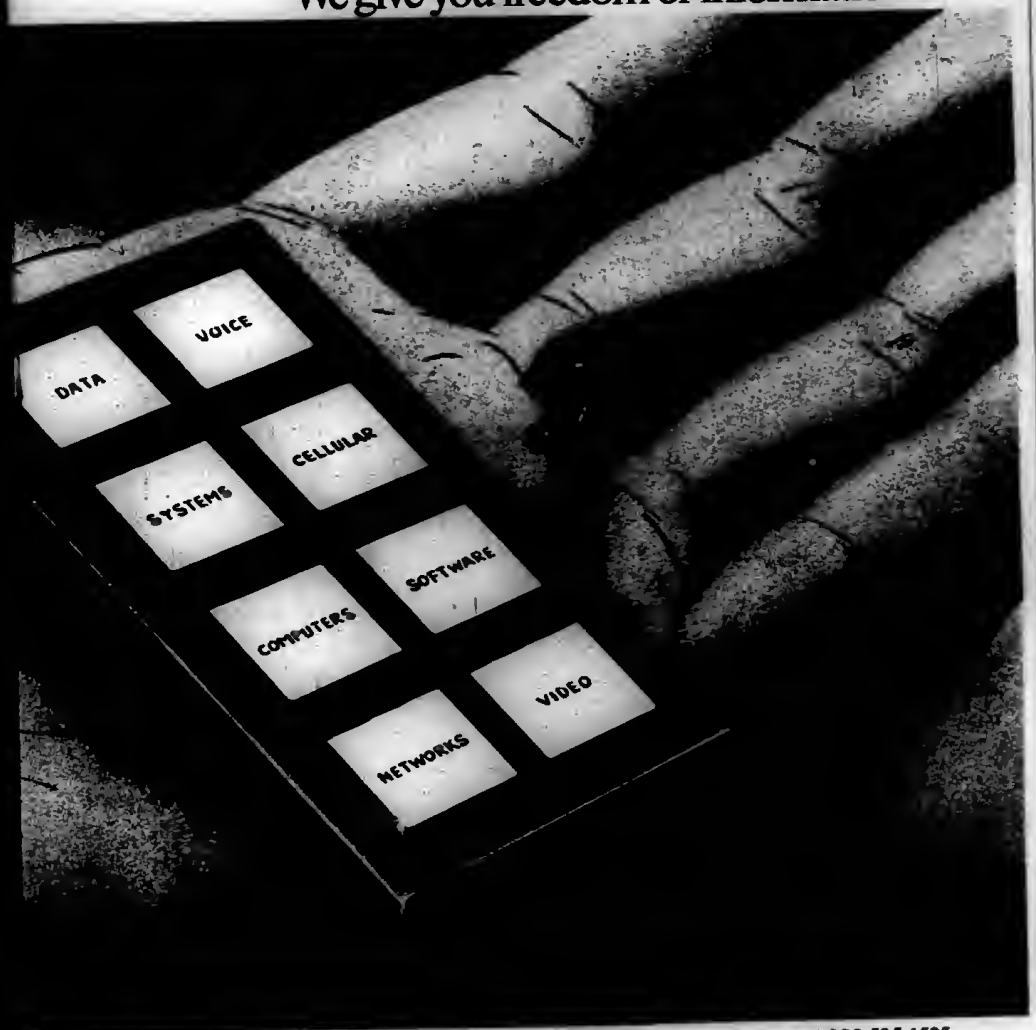

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Tackling the monsters where they live

BY BARBARA FRANCETT

Network nightmares generally divide into three categories: design and planning, implementation and management. The following is a roundup of network issues that have caused more than their share of sleepless nights:

• **Design and planning.** "We're always playing catch-up when it comes to planning," says John Bloodworth, office automation technical analyst at Universal Data Systems/Motorola in Huntsville, Ala. "Our network is growing by leaps and bounds — five to 10 users a week — and the departments don't coordinate their needs until they need them."

• **Implementation.** The school of network hard knocks teaches users to test, test, test if they want implementations to go smoothly. "When we installed the network, we knew what we wanted to do, but we didn't have the time to test adequately," says Rick King, manager of corporate networks at Blockbuster Entertainment Corp. "As a result, it took us longer to solve some problems because we didn't know why the equipment reacted the way it did."

"Cabling can be a big problem, especially on a new installation, says Christopher Cleveland, a systems analyst at Arco Pipeline Co. "Fifty percent of our cabling had to be sent back. You must test."

Making all the network pieces fit together can cause difficulties, Cleveland says. "Sometimes we can't use a product that's really good if it doesn't fit into the environment we've set up."

• **Management.** If setting up a network can be difficult, most agree that ongoing management is tougher.

First National's *networking team is intent on securing data*

"The three principal tasks of network management are performance monitoring, problem detection and handling and service restoration," says Jeff Held, a partner at Ernst & Young. "Products just aren't available that perform all those functions and integrate different vendors' equipment. And no big company is a single-vendor shop anymore."

"The complexity of managing the network is enormous," says Ernie Bolte, system designer at Bolden Engineers, an Atlanta-based consultancy. "It's not only how all the subnetworks are connected to the backbone. The other problem is the sheer numbers of people on the network. Some big nets have up to 10,000 drops to be managed."

Security is also a big management concern, says William E. Spies II, division vice president of telecommunications systems at First National Bank of Maryland in Baltimore. He says the question is this: "How can we make access secure without making it so cumbersome that it's not worth doing?"

Lack of documentation contributes to many network management problems. "Documentation is a problem, even on our small development network," says Rich Goddu, senior consultant at the application integration technical center of GE Information Services in Pleasanton, Calif. "You forget what's configured. We don't have the head count to have someone manage the LAN. On bigger LANs, it's a full-time job."

"The real issue is the growing diversity in networks," says James Herman, a principal at Northeast Consulting Resources, Inc. in Boston. "Users want to move toward interoperability, but they don't know how to manage that complexity," he explains. "Networks will get more complex over the next four years or so. Then the situation will improve as we move toward standardization." •

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The minority void

While professional-level IS opportunities for minorities exist, upper management ranks remain tough to break into

BY AMIEL KORNEL

At first glance, Robert Henderson's future seems assured. Hard-working and dedicated, he has advanced his 12-year career in information systems from night computer operator at an insurance firm to senior systems analyst at a state government agency.

Yet, while his job offers him the challenge he is looking for in IS, Henderson worries that further career opportunities may be limited. As a 29-year-old black man, he fears it will be difficult to reach the senior management ranks of a profession that is overwhelmingly white.

Line management, he suspects, marks the end of the career climb for a black man in IS. "We are not the ones typically in the VP of IS positions," he notes.

Bob Mathews, a black systems manager at Richfood Holdings, Inc. in Richmond, Va., agrees. "All things being even — experience, education and so on — the job would probably go to someone white," he says. "Your chance of gaining great rewards is probably not as good as in other professions," he adds.

Henderson and Mathews are not the only ones who have doubts about how much room there is at the top for minorities. Computer professionals, academicians and recruiters say minority men and women rarely reach the highest ranks of IS management.

Kornel is a former *Computerworld* features senior editor and is enrolled at MIT's Sloan School of Management.

According to U.S. Equal Employment Opportunity Commission (EEOC) figures, progress for minorities has been at a virtual standstill at the high end of the computer career ladder. In 1988, 92% of IS managers were whites, and 8% were minorities — the same percentage split found in 1980 and 1985 (see chart page 59).

"It's very hard to break into the bastion of white male dominance at the senior level," says Beverly Lieberman, an executive recruiter at Halbrecht Associates in Stamford, Conn. Lieberman says she needs only to look around at an IS executive conference to note how few minorities are present. She adds, however, that this is true of business management in general.

Katherine Lambert

Henderson doubts *the likelihood of his rising to upper management ranks in the IS field, though not for lack of desire*

Not for blacks only

The pattern of exclusion is not reserved for blacks. Asked what effect being Hispanic has had on his career, Nicaragua-born Julio Guillen, IS and telecommunications manager at Bio-Rad Laboratories in Hercules, Calif., says, "There have probably been certain situations when promotions have gone elsewhere."

Part of the problem is the lack of strength that comes from pure numbers. "Compared to other business functions, there are fewer minorities interested in information technologies," says James Senn, director of The Information Technology Management Center at Georgia State University.

Vivian Wilson, president of Black Data Processing Associates (BDPA), acknowledges that this is true in terms of blacks. "The field is attracting blacks, but not in the numbers it should be," she says. "Information processing requires a strong background in statistical, mathematical and science disciplines, and minorities are generally not in these areas in school."

Figures from the American Council on Education in Washington, D.C., bear her out. Of the 37,238 students who earned bachelor's degrees in science in 1987, 31,279 were white, 2,620 were Asian, 1,932 were black, 1,259 were Hispanic, and 147 were American Indian.

Minority women have found it particularly tough going in the trek to the top. When Halbrecht Associates was asked to recruit a minority woman as IS director for a quasi-governmental organization in New York, its search turned up only six potential candidates, Lieberman says. It figures: The EEOC reports that of the 8% minority IS managers, only 2.5% are women.

Any mentors out there?

For young minorities, a lack of role models in science- and engineering-related fields can pose a problem.

"Not being able to identify a mentor within the department is what keeps many blacks from

Continued on page 59

- **Lack of role models hurts**
- **Science and engineering education targeted**
- **Minority IS chiefs relay their experiences**

Striving against all odds

How minority IS chiefs overcame prejudice to reach success

BY LORY ZOTTOLA

Some members of minority groups have made it to top jobs in the information systems field. How? Mostly, they say, it was a matter of persistence and developing an eye for the main chance.

As Carl Williams moved up, the ranks thinned out. "A lot of talented blacks never got beyond a certain point in their IS careers," notes Williams, a former senior vice president and director of MIS at advertising agency DDB Needham Worldwide, Inc. in New York.

Williams refused *to let racism impede his climb*

Subtle racism and sexism do exist at the high levels of IS, says Williams, now president of The Intertechnology Group, Inc., an IS consultancy in New York. However, he adds, you can't let the existence of those attitudes stop you.

"There are always going to be those people who don't want to see you on executive row, who are waiting for you to stumble so they can say, 'See, I told you so,' " he says. To prove those naysayers wrong, Williams took charge of his own career during his 25-year climb.

Williams says his take-charge attitude was an integral part of his move up from programmer/analyst at Mead Corp. to various IS management positions at Xerox Corp. and American National Can Co. "I would sit down with managers at every level in my career and make them understand the contribution I thought I was capable of making to the company."

Those discussions, Williams says, were couched in business terms. "When I talked about my career objectives, I made sure those objectives were consistent with where the organization was going. You can't move your career forward in a vacuum."

Wilma Horne knows what Williams is talking about. She credits creating opportunities where none existed before as the key to her success in a white male-dominated business world. "Prejudices didn't stop me along the way," Horne explains. "I decided what I wanted to do, I prepared myself to do it, and then I did it." Today, 48-year-old Horne is IS director at the New York Port Authority.

The bottom line, Horne says, is that minorities must seize opportunities. "There's got to be something that makes you the one chosen for the job: willingness to take risks, taking on a job that others think is unpopular, your ability to relocate and yes, the fact that you are a minority."

Horne tells of the time in a meeting in which discussion centered on IS' inability to fill a position with a qualified minority. "I asked them, 'Why are you looking so hard when here I am sitting right across the table from you?' " She landed her first management job.

Both Horne and Williams stress that their audacity is backed up with solid education and experience compatible with the demands of a computer-related career.

Horne brought *herself to managers' attention*

Horne's background is in mathematics, a subject she taught for seven years in the Chesapeake public school system in Virginia. Her interest in computers became something more solid when she took a summer grant to introduce computing to that school system. She was hooked and left teaching to become a bureau programmer trainee at Air Products and Chemicals, Inc. in Allentown, Pa.

Williams holds a bachelor's degree in liberal arts, has a background in civil engineering and received an MBA from the University of Rochester in New York.

Pragmatism has also played a big part in their careers, both IS executives say. "You've got to talk to people about where you want to be," Williams says, "but if it looks like getting ahead is not going to be possible in that corporate structure, then go to where it will be."

Horne has moved six times in 20 years to get the kinds of positions she's wanted. "I took the risk. I had to go to where the opportunity was," she explains.

The fact that they've made it further than most minorities in their profession is not lost on either Williams or Horne. They say being role models for other minorities is important.

"For minorities in IS who think opportunities are limited, I hope my success will let them see that that's not 100% true," Horne says. Horne has spent time talking to juniors and seniors in high school about career opportunities in IS.

"It's a 'credibility factor,' Williams says. "It's more credible for me to say to a young black MBA that hey, here are some of the things you're going to have to go through, and here are some of the options you have for handling those situations."

Neither downplays the existence of discrimination, but they say you can face prejudice and stare it down. "Knowing it's out there should keep you on your toes," Williams says. "Knowledge is the power you've got to make work for you." ●

Zottola is *Computerworld's* senior editor, in depth.

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Continued from page 57

moving forward," says Chet Holmes, an account manager at Candle Corp. in Los Angeles who started his career in IS.

While accounting for 10% of the total work force, blacks held only 2.2% of the nation's science and engineering jobs in 1986 (the most recent year for which figures were available), according to a report by the National Science Foundation.

"In a black household in the past," Henderson says, "it was very rare to find a college-educated black man who had anything related to scientific training."

According to the American Council on Education, between 1976 and 1987 there was a 16.9% drop in black science baccalaureates. Henderson says he hopes his experience and that of other minorities will change that trend. "We're starting the tradition now," he says.

Wilson agrees and points out that her organization — with a national membership of 1,400 — is actively working to encourage its members to become mentors to high school and college students.

BDPA also sponsors a national competition in computers and information processing for high school students and gives scholarships to winners. This year's competition involved more than 1,500 students in 18 cities. "The idea is to expose students to what it is like to work in this field and encourage them to go on to college with this in mind," Wilson says. "In this way, we act as role models."

For those minorities who do enter the field, climbing the corporate ladder often requires working extra hard to overcome doubts that some colleagues may have about their abilities.

Minority IS professionals report that their achievements and failures are often magnified in the eyes of white management. "They expect you to be more on the ball," says Debbie Gore, a black information security administrator at Federal Mogul Corp. in Detroit. "You have to prove yourself."

This intensive scrutiny, however, can be a benefit, she says. "If you end up getting a reputation for being very good, things move your way."

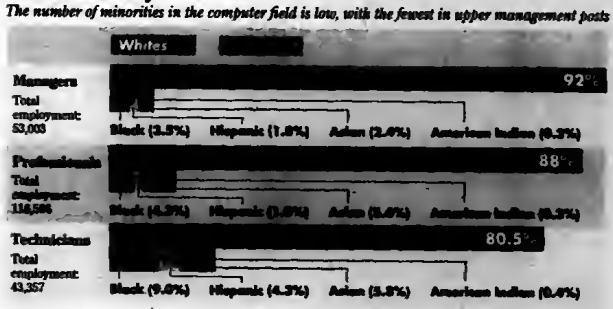
"I make sure that I perform at at least 120%," Henderson says. "I make sure that I break every kind of stereotype that anyone may have."

For some minorities, stereotypes can work in their favor. "I consider my Asian background an asset," says Duk Won, Korean-born president of Applied Systems Institute, a software company in Washington, D.C. He says he has gained an aura of competence because many people view Asians as gifted in technology-related

Continued on page 60

In the minority

The number of minorities in the computer field is low, with the fewest in upper management posts



Source: U.S. Equal Employment Opportunity Commission

CW Chart: Doreen St. John

IS resources for minorities

American Indian Science and Engineering Society
(303) 492-8658
Students and professionals in science, computing and engineering fields

Association for Women in Computing New York chapter
(212) 482-4809

Black Data Processing Associates
(800) 727-2372

Council on Career Development for Minorities
(214) 631-3677
Counsels undergraduate students and recent graduates about jobs in business, including the IS field

Edges Group
(212) 553-2365
Minority entrepreneurs and management personnel
Contact: Ramona Frazier

National Institute for Resources in Science and Engineering
(301) 770-1437
Technical assistance for minorities
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Society of Hispanic Professional Engineers
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Continued from page 59

areas. Some Asians say being characterized as technologists can become a liability when seeking a management position. In fact, while Asians have a large presence in IS in proportion to their total population, their numbers drop at IS management levels, EEOC figures show.

However, Ann Li, corporate vice president at Paine Webber, Inc. in Weehawken, N.J., says the problem is faced by "anyone who is a techie." Head of the brokerage's proxy department, Li previously managed IS at the Federal Reserve System.

Prejudice rears its head

Nonetheless, the question remains: Why have so few minorities broken into senior management positions in one of the fastest growing professions?

Part of the answer, no doubt, lies in the intolerance bred by age-old prejudices. Blacks, Hispanics and Asians interviewed for this story, however, insist that they've rarely experienced open hostility and prefer using euphemisms such as "color sensitivity" and "traditional attitudes" when talking about what in an earlier era would have been simply labeled racism.

"You can't spend time placing blame on a mind-set that has been around for a couple of hundred years," Henderson says. "It's better to learn to work with or around that mind-set."

"No one is going to come out and say, 'You can't have this job because you're a minority,'" Mathews says. "The only person who can stop you is yourself."

Minority professionals assert that their career advancement depends at least as much on their skills as on their race. Some also say that part of the fault lies with cultural traits and traditions that are a poor match for the personality profile of top IS jobs.

Jaurney Chew, a network switching director at US West who was born in China, notes that Asian culture emphasizes unquestioning obedience and silence, traits that are an anathema to U.S. management technique. "The American corporate environment is interested in having people take the initiative," she says.

Chew, who oversees a staff of nearly 400, has learned to make these differences work for her. "Some people will see the disparity in culture and say, 'What is there to do?' I try to take advantage of the best qualities of both worlds." Chew says that while she's working on being more assertive, she prizes her quietness because it makes her a good listener.

What the future holds

Learning to blend cultures in the business environment is one kind of education minorities say they go through to get ahead. As for more formal schooling, educators are paying closer attention to providing minority students with the math and science training they need to prepare for future careers in technology.

In the Washington, D.C., area, for instance, big businesses are funding an all-minority program in which 600 to 700 students are receiving help in developing their math and science skills, according to Lynford Lautz, executive director at the Fairfax County Public Schools Education Foundation.

Using grants from various businesses, the Washington, D.C.-based Quality Education for Minorities group has recently announced its goal to sponsor programs that will quadruple the number of minority students with degrees in science, math and engineering from about 17,000 in 1987 to 68,000 in the year 2000.

There are positive signs that changes are already occurring in education. While the number of science degrees for blacks is low, the number has grown between 1976 and 1987 for Hispanics (44%), Asians (112%) and American Indians (3%), the American Council on Education reports. Degrees in engineering for minority groups combined during that same time period have risen a whopping 208%.

Such measures leave room for hope, according to IS professionals. As attitudes change and training and education begin to bear fruit, minorities may finally appear in greater numbers at all levels of IS. "Sooner or later," Gore says, "the walls have to come down." •

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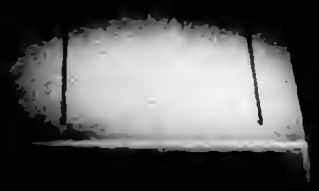

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Backward march

Computer-aided software engineering products vendors who want to go forward are well advised to turn backward, according to a recent report from market research firm **Forrester Research, Inc.** During the next five years, the report says, reverse engineering capability — the automated ability to extract knowledge from already existing software code — will grow from a $34 million niche to a $700 million market.

It's a date

IBM and **Clayton & Dubilier, Inc.**, the company that is forming a firm to acquire IBM's typewriter and low-end printer business, announced last week that they expect to close their deal by March 31. The new organization, which will be called **Lexmark International**, will be headed up, as was stated earlier, by IBM veteran executive Marvin Mann.

A new Paradigm

Four-year-old start-up **Paradigm Corp.**, a San Jose, Calif.-based static random-access memory (SRAM) manufacturer, is among the latest Silicon Valley firms to attract trans-Pacific investment. Japanese steelmaker **NKK Corp.** will pay an unspecified sum for an approximate 10% stake in Paradigm, license rights to its current SRAM lines and their fabrication processes and co-development of a new generation of 4M-bit SRAMs.

Outlook for future quarters dim

BY NELL MARGOLIS
CW STAFF

Computer industry earnings reports for the fourth quarter — traditionally the industry's strongest — are likely to limp in with less of their characteristic zing, according to analysts. Undeclared war and undesignated recession, said Byron Walker, an analyst at Moody's Investor Services, were nevertheless sufficient to put the fear of spending into the very customers whose usual zeal to "use up annual capital budgets before they lose them" fueled late-year surges for computer firms.

What's more, analysts widely agreed, the dimmed bottom lines in the quarter just closed are a good bet to be the brightest we see for several quarters to come.

"The chances of the first quarter being a black hole have gone way up," said David Wu, an analyst at S.G. Warburg & Co. "[Computer lessor] Comdisco, Inc., which picks up business whenever big companies need computers but can't afford to buy them, is doing very well. Wherever I look, I see the signs: People are feeling poor."

NCR Corp.'s fourth-quarter earnings are a case in point, Walker said. NCR's management has brought about one of the industry's more impressive turnarounds, according to industry observers. A barrage of new products helped boost fourth-quarter revenue 6% over last year's comparable quarter, to $1.9 million. Nevertheless, the high costs of corporate and product-line transition, coupled with customer budgets on hold, hammered NCR's earnings: The firm's fourth-quarter profits dropped 15%.

What should have been a strength for NCR is suddenly a liability, Walker said. "They've got these great niches: retail and finance," he noted. "For the last decade, these have been wonderful. They aren't wonderful right now."

Similarly, Beaverton, Ore.-based on-line transaction processing systems vendor Sequent Computer Systems, Inc., recently one of the computer industry's higher flyers, has warned that its fourth-quarter report will likely show a dramatic earnings decrease, revenue gains notwithstanding. "During the last few weeks of 1990, it became evident that concern over the economy had made customers much more cautious and that capital expenditure was being postponed," said Sequent President Scott Gilson in a prepared statement. Consequently, "intensified competition" and "more aggressive pricing" squeezed the firm's margins "significantly below expectation," Gilson said.

Budget paralysis in once-rich niches — particularly the financial industry, whose previously soaring fortunes buoyed many a computer company's bottom line — are by no means nightmares for NCR and Sequent alone, Walker noted. On the contrary, "this is a story we're going to be hearing over and over [with regard to the] fourth quarter," he said.

Recession tends to polarize markets, analysts said. Advantage shifts to large, well-entrenched companies with strong balance sheets and attractive new products, at one extreme, and to nimble entrepreneurial firms unencumbered by conservative corporate bureaucracies and huge investments in archaic technology, at the other.

This trend will mount over the coming months, Wu said. "The strong will get stronger; the weak will get devastated."

As the fear of war hardens into reality, analysts agreed, the first quarter — traditionally the computer industry's low point — could make the dull fourth quarter shine by comparison.

"If a prolonged war — more than four to six weeks — drives the price of oil up, consumer confidence will drop significantly, and we will face a protracted recession instead of the middle-of-the-road one that we thought was here," said John B. Jones Jr., an analyst at Montgomery Securities.

With little certain but uncertainty and with uncertainty one of the best recognized foes of capital spending, even the more glowing fourth-quarter numbers may not presage ongoing bottom-line strength, industry observers said.

"IBM had a great December quarter," Wu noted, "but it could be that all the business that could have been closed, was."

Industry observers hastened to add that the current convergence of factors — recession, war, industrial maturity, a financing sector in crisis and the industry's traditional slow season — is extraordinary and temporary. "When the recovery begins — possibly as soon as the second half of this year — the computer industry should emerge as one of the stronger survivors," said Richard A. Shaffer, president of New York-based Technologic Partners.

1990 fourth-quarter earnings
A troubled economy tarnishes the computer industry's traditional best quarter

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Parentheses indicate a reduction or loss
* Both revenue and net income for the quarter ended December 31, 1990 include extraordinary items
** Results include the operations of Imprimis Technology, acquired October 29, 1989

CW Chart: Paul Mock

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Financial group seeks growth despite bank busts

BY JOHANNA AMBROSIO
CW STAFF

It is a scene that is almost stereotypical of a small, aggressive vendor: Someone gets a bright idea and tries it out. If it works — that is, if it contributes to the bottom line — the idea is institutionalized in a more formal way.

That was pretty much how the Financial Services Industries group was formed, except it was formed by IBM, a company that does not usually come to mind when small, feisty entrepreneurs are mentioned.

Moreover, despite current upheaval in the banking industry — in fact, to some extent, because of it — IBM Financial Services Industries plans to keep on growing.

"We see continued growth, if not in the double digits, then at least in the single digits," said T.G. Hudson, vice president of IBM Financial Services Industries. He said his group can survive the economic downturn by providing software and services to those banks and brokerages that can no longer afford to — or for other reasons choose not to — provide for themselves.

Formed in 1988, Financial Services Industries was originally chartered as a worldwide development organization for bank-specific products such as check readers and sorters.

New directions

Now the group makes, buys and gets other IBM divisions to develop products for this industry, Hudson said. "We're a newer part of the [IBM] organization, and we have responsibility for both products and customers." Development labs are running at various locations, including Charlotte, N.C., and Tampa, Fla. The idea to have one line manager accountable for both was first tried out in IBM's Asia Pacific group when Hudson was over there and has since been formalized.

Financial Services Industries and its sister divisions in insurance, manufacturing and distribution collectively account for 15% of IBM's revenue, Hudson said. And if Hudson has his way, that number will remain the same this year. One way Hudson hopes to attain that goal is by growing three new businesses formed within the services group: applications software, systems integration and outsourcing.

The group's software business, in which IBM buys or develops core applications such as retail banking and trust accounting, has grown fivefold during the last three years. Hudson said he expects it to double again this year to revenue of more than $100 million. The same general growth pattern holds true for systems integration, which is already a $100 million-plus business, he said.

In addition, outsourcing for banks and brokerages is "rapidly growing, with hundreds of millions of dollars of business in 1991." Hudson said he expects that number to grow to over $1 billion within the next few years.

Overall, the Financial Services Industries group is responsible for "a significant piece of the IBM customer set," Hudson said. "If it's not the largest, then it's the second largest next to manufacturing."

The division has a budget of "hundreds of millions of dollars" to invest in software — both homegrown and acquired through equity investments in IBM software partners (see story page 65).

Products in the works

On the product side, the group is working to round out its financial services architecture announced last year. It includes data models, hardware and software that allows banks to connect and use enterprisewide systems.

Also in the works is a project codenamed Bankvision, aimed at integrating workstation technologies, artificial intelligence and a spreadsheet into an approachable front end for users such as loan officers.

"This is already being done in pieces," Hudson said; however, he added, Bankvision will bring all the pieces together into a coherent whole. He said it is now in a prototype stage and is being beta-tested at two banks. Bankvision will likely be demonstrated and might be introduced in March at IBM's banking conference in Albuquerque, N.M.

Hudson said his group's suite of products and service offerings could be just the right mix at the right time. "Traditionally, banks have tended to do it all themselves," he said. "But now there's more software available than there was five years ago, and many of the original banking systems are based on outdated technology."

Nor is Hudson overly worried about the economic downturn. "The merger and acquisition activity may force banks through an analysis of their systems to see if they're robust enough to take them through this period," he noted. Bad times for banks might mean good times for IBM Financial Services Industries.

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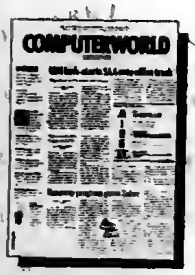

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Quicker switch

Nippon Telegraph and Telephone Corp. (NTT) has moved up by approximately one to two years its schedule for switching its nationwide telecommunications networks to digital technology, the company has announced. Medium- and long-term digitalization plans were advanced in accordance with a Japanese government requirement to boost domestic market competition formerly dominated by NTT. Under the new plan, the first stage of a two-stage subscriber exchange conversion — consisting of the replacement of nonelectronic crossbar exchanges with stored program control exchanges — is scheduled to be completed by March 1995, one year ahead of the previously announced schedule.

Firsts in Brazil

An October 1990 **Brazilian government** decision to allow joint ventures between domestic and foreign firms recently resulted in a deal that logs three firsts in one. According to a report in the British financial press, IBM's microcomputer manufacturing venture with Brazil-based SID is the first deal announced under the new policy. The deal is also being recognized as Brazil's first joint venture in information technology and IBM's first joint venture aimed at producing one of the company's own principal product lines.

Not-so-tiny Tim

Japan's **Toshiba Corp.** and Taiwan's **Investa Electronics Co.** are joining forces to produce facsimile machines in **Malaysia**, the companies announced earlier this month. According to the plan, their joint venture company — to be called **Tim Electronics Sdn. Bhd.** and located on Penang Island — will make 100,000 fax machines annually, with that number scheduled to double in 1994. Toshiba, which will own 51% of Tim Electronics, reportedly turned to partnership to save on labor costs; 49% owner Investa reportedly was attracted by the chance to gain fax machine manufacturing know-how.

After the fifth generation

While still suing for increased commercial-sector attention for its fifth-generation parallel-computing technology, Japan's **Ministry of International Trade and Industry (MITI)** is about ready to set up a committee to study the possibility of developing a so-called sixth-generation computer that would more closely imitate the workings of the human brain, according to the ministry. The MITI, which is best known for backing Japan's strong buildup of high-technology industry, said it plans to open the project for joint study with European and U.S. researchers.

Hogan investment pays off

One key part of IBM Financial Services Industries' strategy is buying products by means of equity investments in other vendors rather than building everything itself. IBM has closed seven such deals to date.

In September, it bought a 5% stake in Dallas-based Hogan Systems, Inc., a longtime partner. The two jointly sell and develop Hogan's Integrated Banking Application. In addition, IBM and First Boston Corp. are joint-venture partners in a financial software firm called Seer Technologies, Inc. in New York.

A new departure for IBM, the equity deals mark the firm's "very strong effort to become a software and services vendor," Financial Services Vice President T.G. Hudson said.

The Hogan relationship has had its ups and downs. The original marketing and development agreement, which did not include an equity investment, was announced in May 1986.

However, as the publicity died down, so too, it seemed, did the IBM sales force's desire to pitch the Hogan software to customers. For several years the package appeared to languish.

According to Hudson, one reason for the admittedly long learning curve in the relationship was that responsibility for the Hogan deal had been split among seven different managers in two IBM divisions. "This was not a formula for efficiency and success," he said.

But all that is history, Hudson claimed. An infusion of money and development attention have made the IBM/Hogan relationship "an excellent [one] and very stable," he said. "We rallied behind the product as we took responsibility for it." Some 86 banks now use the Hogan package.

JOHANNA AMBROSIO

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Axel Leblois, Chairman and CEO, IDC

1991 U.S. IT Spending Outlook
David C. Moschella, Sr. V.P., Worldwide Research, IDC

The Shifting Fortunes of the Networking Industry
Kim Myhre, Sr. V.P., Worldwide Consulting, IDC

The Restructuring of the Computer Industry
Panel Discussion, Chaired by David P. Vellante, V.P., Systems Research, IDC

Perestroika Comes to the Data Center: IBM and the MIS Revolt of the 90's
Frank Gens, V.P., Technology Assessment, Technology Investment Strategies Corp.

Managing Channels for Growth
Lee M. Levitt, Dir., Distribution Channels Research, IDC

Workstation Evolution: Up or Down
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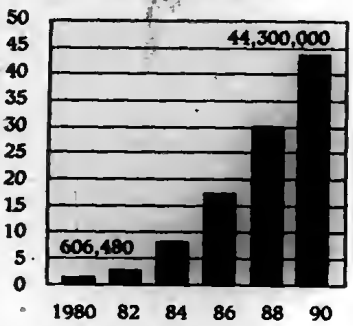

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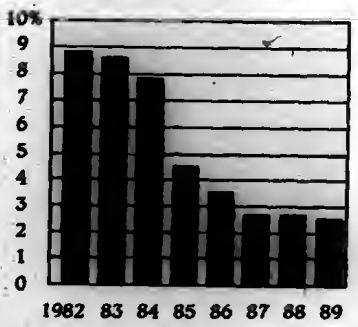

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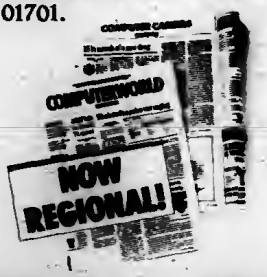

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Temporary work can soothe layoff sting

LIFE AFTER LAYOFFS

This is Part 2 of a three-part series tracking IS professionals' attempts to recover from job losses.

BY ALAN J. RYAN
CW STAFF

Nothing is permanent — *especially* a job. That's what Paul Styrvoky found out when a change in management at his company resulted in the loss of his position as manager of the corporate systems audit department last May.

After nine years at Ecolab, Inc. in St. Paul, Minn., Styrvoky's position was eliminated. Next week, Styrvoky will again face the prospect of being jobless when the temporary contract position that he has been holding for several months at St. Paul-based Land O'Lakes, Inc. — conducting an audit of the information systems department — ends.

When he joins the ranks of the unemployed this time, however, Styrvoky will view the situation from an enlightened perspective. Of his contract post at Land O'Lakes, he says, "This is temporary but so were the nine years at Ecolab."

Styrvoky is one of a growing number of IS workers left jobless because of a shrinking economy and who has turned to contract labor while conducting a search for long-term work.

For many who have been laid off, working on a contract basis is a good way to pay the bills. The hourly rate is often generous for IS professionals, the schedules allow flexibility, and some contracts last many months.

In addition, the contract laborer also has the opportunity to view internal postings at the company holding the contract and can sometimes apply for those positions as an internal candidate.

A drawback, however, is that the contract workers are rarely provided with company-paid health insurance.

Contracting the work is also a safe way for the employer to increase its work force temporarily on an as-needed basis, according to Jim Kwapick, director of IS recruiting at Robert Half International, Inc. in Minneapolis.

"It is easier, more cost effective and organizations can staff up and down less painfully," Kwapick says.

Recruitment push

Like most people who discover that their jobs are not secure, Styrvoky's first thought was to find another job. "The recruiters pushed me on the market pretty quick," he says.

However, after his layoff from Ecolab, Styrvoky realized he was not ready to launch another chapter of his career without first taking some time for himself and his family.

During the summer, he dabbled in some consulting work but did not begin looking for another full-time position in earnest until the fall. At that point, job placement specialists at Robert Half recommended him for the temporary post at Land O'Lakes.

In many ways, Styrvoky says, being laid off has been a positive experience, and working on a contract basis has kept him in the wage-earning category while also giving him the flexibility to continue his job search and go to job interviews.

Alvin Urbano

Turning misfortune into opportunity. *Styrvoky is using the extra time he has since his layoff to give more attention to his family and personal life*

Before accepting the temporary assignment at Land O'Lakes, Styrvoky says he made it clear to the company that he would need a schedule flexible enough to allow him time off to go to job interviews. "I told them I would not shut my job search down, so I do bop out of here a lot during the week."

Job hunting is time-consuming, and Styrvoky says he is lucky that his former firm has provided him with outplacement services. He can work on his cover letters and resumes on his personal computer at home, but the outplacement firm handles the typing and mailing of resumes and letters for him.

Styrvoky is optimistic that when his contract expires at the end of this month, he will be busy going to second-round interviews for jobs at other organizations and consulting companies. And he believes he will land a job soon.

He says he has had at least one interview per week since fall, and during the week prior to Christmas, he had interviews every day.

"I keep telling myself that the very good, professionally rounded people are employable."

Still, the pressure of uncertain employment is difficult. Styrvoky says he holds no animosity toward his former company, but he has faced a lot of personal pain in dealing with the loss of his job.

"I had made a huge investment in the previous employer," Styrvoky says, "and I walked away with nothing because I do not believe in taking things you build for somebody else."

What he did get, however, was a chance to re-examine his life and priorities. "It was a good time to take a look at things going on in the family and the marriage and get those things on track," Styrvoky says.

He admits he's always had a strong inner drive to create perfect products, which led him to work long hours at Ecolab. There he audited new systems being implemented and performed technical and general control reviews throughout the world.

"Now I've found that I can tune that energy down and still deliver what the employer wants but funnel my extra energy into family or church," says Styrvoky, who has four children.

With layoff, surprises

The experience of being laid off has been humbling, Styrvoky admits. "When I look back on this in a year or five years, it will be one of the most pivotal points of my life."

He was pleased to learn that people he had known in high school and college still remembered him and his skills. That network has been instrumental in his job hunt.

He has also contacted job consultants and recruiters on both coasts and locally, and he says he is willing to relocate for the right job.

Styrvoky's background experience includes being an applications developer, designer and technical systems programmer, but Styrvoky says he is also interested in continuing his work in systems auditing. Other possibilities include business management positions in nonprofit organizations, consulting or systems management in an IS department.

Ryan is a *Computerworld* features senior writer.

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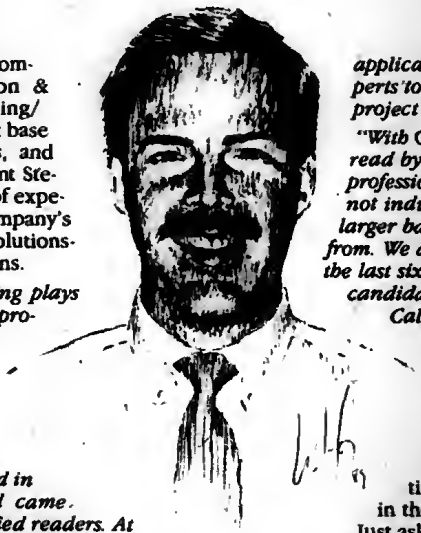

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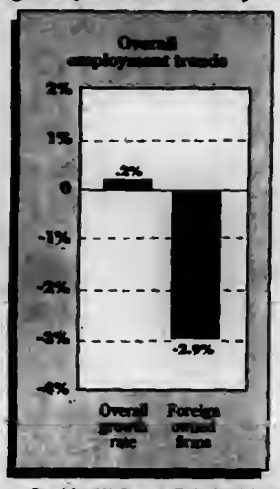

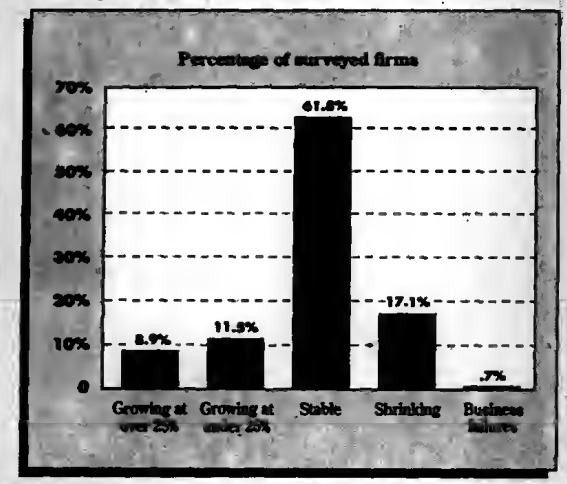

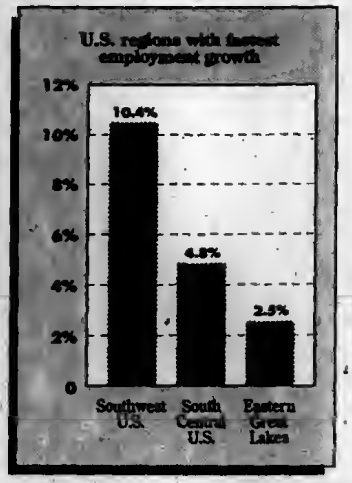

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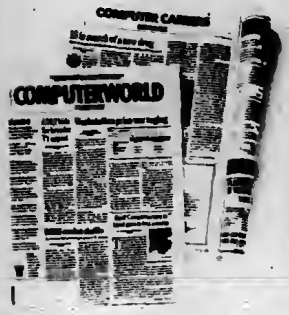

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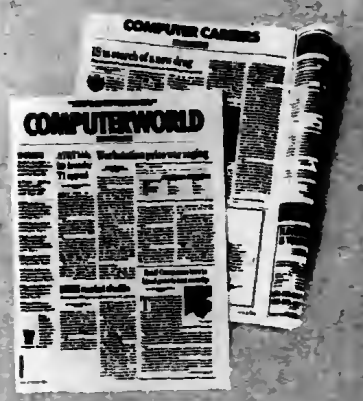

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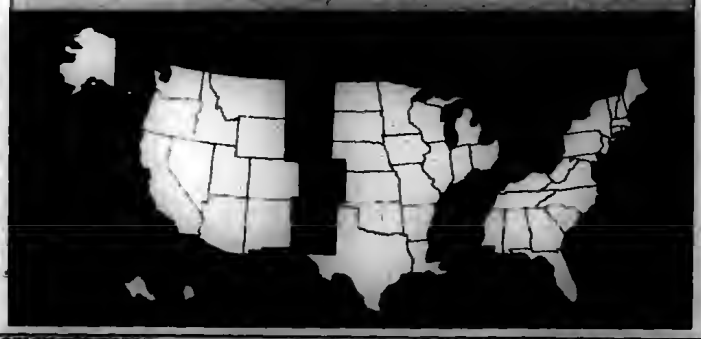

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"We're in a highly competitive business," says John F. Bonney, Director, Customer Education Services at Hitachi Data Systems. "In addition to the major players in the IBM-compatible mainframe training world," he adds, "there are dozens of smaller vendors with good name recognition. In order to be a standout in this industry, great service and excellent reputation are simply not enough. We need to keep our name, our product offerings and our class schedule in front of our current and potential customers constantly."

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MARKETPLACE

Court warns against abusive licensing

Editor's note: Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY HOWARD ZAHAROFF
SPECIAL TO CW

Information systems managers who are worried about the extent of control that licensee give vendors over use of their software packages can take solace from a recent court ruling that rejected an infringement claim because the vendor's license agreement was too broad in nature.

At first glance, the case of *Lasercomb America, Inc.* v. *Holiday Steel Rule Die*, tried in the 4th Federal Circuit Court of Appeals, involved a glaring example of infringement by the defendant. Here are the facts:

Lasercomb is a manufacturer of steel rule dies used to cut and score paper and cardboard for folding into boxes and cartons. It developed a software program known as Interact (the object of the dispute) to be used by a designer to create a template of a cardboard cutout on a computer screen and to direct the mechanized creation of the conforming die. Lasercomb's license agreement provided that during the term of the agreement, defined as 99 years, and for one year after it expired, the licensee would neither develop, sell nor assist others in developing or selling any kind of computer-assisted die-making software.

The agreement also required the licensee to restrict its directors, officers and employees from engaging in these activities during the term of the agreement. Thus, any customer wishing to use Interact would have to agree to refrain from developing a competitive program, whether infringing or not, for one century.

The defendant, Holiday Steel, also a manufacturer of steel rule dies and a competitor of Lasercomb, obtained four prerelease copies of Interact but never returned a signed license agreement. According to the case, "Lasercomb had sent the agreement to Holiday Steel with a request that it be signed and returned. Larry Holiday, however, decided not to sign the document, and Lasercomb apparently overlooked the fact that the document had not been returned."

Holiday Steel promptly circumvented Lasercomb's protective devices, made unauthorized copies to use on its own computer systems and finally renamed the program and marketed it as its own product. In light of this activity, the District Court found Holiday Steel liable to Lasercomb for copyright infringement and enjoined it from marketing this product.

The Appeals Court agreed with the District Court's findings of fact: "There is no question that the defendants engaged in unauthorized copying." However, to the surprise of many, the Appeals Court rejected the lower court's finding of infringement, reversed its award of damages and lifted its injunction.

The reason? Copyright misuse. Both copyrights and patents are forms of legally sanctioned monopolies. In order to encourage inventors to invent and authors to create, the law grants them certain exclusive rights in their inventions (under the patent laws) and works of authorship (under the copyright laws).

In last month's Legal Eye column [CW, Dec. 17], Raymond Nimmer explained why patents are a stronger form of protection than copyrights. For many years, courts have recognized that if a patent owner abuses this powerful monopoly — for example, by forcing everyone who wants to use the patented technology to purchase unpatented items from it — this abuse constitutes a defense against a claim of patent infringement. This defense is known as patent misuse.

In *Lasercomb*, the 4th Circuit became the second court to recognize explicitly that there exists a defense of copyright misuse analogous to the defense of patent misuse. (*Lasercomb* was soon followed by *Broadcast Music, Inc.* v. *Hearst/ABC Viacom Entertainment*, in which the District Court for the Southern District of New York also recognized that copyright misuse may be a permissable defense).

The court concluded that Lasercomb, by providing in its license agreement that the licensee not produce computer-assisted die-making software during the term, attempted to use its copyright to eliminate competition in the steel rule die business. Because this was beyond the scope of the rights the copyright gave it, the court deemed this a "misuse" of the copyright and a valid defense against Lasercomb's infringement claim.

Under the circumstances, perhaps most startling is that the court recognized this defense even though the defendant behaved so unreasonably and was not directly affected by the misuse. As the court wrote:

" . . . Lasercomb's anticompetitive clauses in its standard licensing agreement constitute misuse of copyright . . . The defense is available to appellants even though they were not parties to the standard licensing agreement."

BOTH COPYRIGHTS AND patents are forms of legally sanctioned monopolies.

The moral of this case is that IS managers and software suppliers should review license agreements to determine if any provisions could be interpreted as misuse.

Wise companies will consider revising their agreements to remove unreasonably broad restrictions to preserve their ability to assert their copyrights against infringers.

Zaharoff is an attorney at the Boston office of Brown, Rudnick, Freed & Gesmer. He practices, writes and speaks on computer law issues.

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AT Model 239	$875	$1,025	$750
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,100	$1,300	$1,025
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,000	$3,500	$2,500
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,450	$1,000
SLT 286	$2,300	$2,500	$2,000
Portable 386	$2,300	$2,800	$2,300
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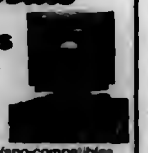

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Proposal specifications and requirements are available from Ms. Lynda Christensen, Manager of Fiscal Services, McCarran International Airport, P.O. Box 11005, Airport Station, Las Vegas, Nv. 89111 or by phone (702) 739-5113.

To be considered, proposals must be received by Ms. Christensen prior to the close of business, 5:00pm, February 27, 1991.

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RFP No. 1991, due Tuesday, February 5, 1991 at 3:30 p.m. for the acquisition of 34 A-D plus plotters for the MISSISSIPPI STATE HIGHWAY DEPARTMENT Project Offices statewide.

RFP No. 1989, due Thursday, February 7, 1991 at 3:30 p.m. for the acquisition of a 11x17 high-resolution laser printer and controller for the Print Shop at the MISSISSIPPI STATE HIGHWAY DEPARTMENT.

RFP No. 1993, due Friday, February 8, 1991 at 3:30 p.m. for the acquisition of an MS-DOS software package that automates and supports the functions of Quality Assurance and Medical Staff Services for the UNIVERSITY OF MISSISSIPPI MEDICAL CENTER.

RFP No. 1995, due Wednesday, February 6, 1991 at 3:30 p.m. for the acquisition of new workstations and the upgrade of existing Intergraph workstations for the MISSISSIPPI STATE HIGHWAY DEPARTMENT.

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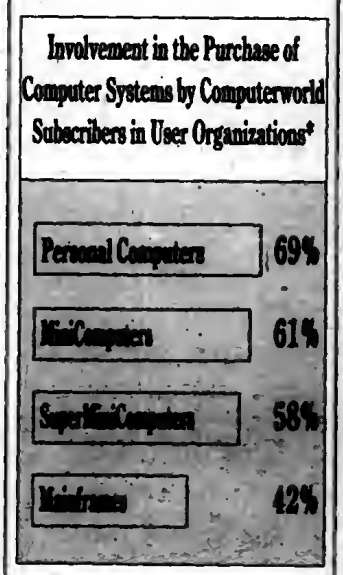

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A lean, mean training regime

A depressed economy is forcing IS managers to watch their bottom line

BY ALICE LAPLANTE
SPECIAL TO CW

First of a two-part series

Despite a tough economic road ahead, many companies are still keeping their information systems training programs on track. Rather than receiving the usual cutbacks, training managers are reporting significant support for their efforts.

However, the continued backing is coming with one caveat: Be prepared to reduce training programs if necessary in the future and do so without disrupting the company's ability to meet users' needs.

There are a number of methods by which managers can brace themselves for possible cutbacks and keep their training budgets lean:

- Hire outside consultants on a contract basis.
- Buy prepackaged training courses to be delivered either in an instructor-led classroom situation or using alternate media.
- Take advantage of free training offered by hardware and software vendors.
- Ask IS employees to stand in as trainers in their particular areas of expertise.

For example, at Johnson Controls, Inc., many training classes are required — not optional — and the number of training dollars is allocated as a percentage of annual gross sales.

"However, as a recessionary period begins to unfold, we're trying to use innovative ways to deliver training," says David Podeszwa, manager of the training and education division at the Milwaukee company.

Previously, employees would have traveled from a remote company office to the Milwaukee headquarters for a software training class. Now, an instructor is sent to the remote site to save travel expenses, says Podeszwa, who manages a full-time staff of 50 and is responsible for training more than 18,000 employees located at various sites around the U.S.

Johnson Controls has also found that delivering training via alternate media, such as interactive video or computer-based training, can be less expensive than instructor-led classroom training, according to Podeszwa.

Other IS managers find ways to reduce expenses by taking advantage of free services offered by hardware and software vendors.

"Training is a high priority, but individual managers must make what resources they have much more effective," says Patricia Macsisak, manager of the end-user support group at Amdahl Corp. in Sunnyvale, Calif. "For me, this means looking at the technical training needs of the organization and trying to find ways to leverage my 10-person staff and maximize the services end users can get for the money I am budgeted," she adds.

Freebies help

Macsisak says free classes for products offered by Microsoft Corp., Lotus Development Corp., Zenith Data Systems and other vendors help her train and educate end users with a minimum of cash outlay.

"Many vendors are finding that to be competitive, they need to provide their large corporate customers with free services such as training," she says.

Because of these free services, Macsisak says, she will be able to provide more training to Amdahl employees in 1991 for less money than she was able to provide it in fiscal year 1990.

One disadvantage to vendor training, Macsisak adds, is that vendors tend to offer generic classes that teach the "basics" of a product or technology. "But with the vendors' knowledge of the products and our knowledge of the company, we can usually create a very nice fit [of training to needs]," she says.

A temporary fix

According to IS trainers and managers, probably the most common way for a corporation to provide high-quality training is to keep a small full-time staff and hire part-time or contract trainers on an as-needed basis.

"We are organized so that we can easily scale back our operations if the company has to do some belt-tightening — which seems more and more likely," says David Stanfield, manager of the MIS education center at Glaxo, Inc., a pharmaceutical company in Durham, N.C. Stanfield's department has the responsibility of training more than 3,000 end users.

"Although we do a huge volume of training, we only have a small internal staff," Stanfield says, adding that he currently has 90 to 120 training instructors under contract.

"My company is committed to technical training in terms of dollars but not in terms of hiring permanent training employees," he says.

To control the quality of the training delivered to Glaxo end users, Stanfield and his staff prepare all course material themselves, hiring outside trainers to deliver it.

This arrangement makes it easy to scale back on expenses if necessary. "We simply schedule fewer classes," Stanfield says.

Other companies also use outside contractors but rather than develop course material themselves, they buy it from the vendor. The decision to make or buy in such cases usually comes down to cost.

For basic classes such as introduction to Lotus' 1-2-3 spreadsheet or Ashton-Tate Corp.'s *Dbase*, training materials can often be purchased for much less than it would take to reinvent the wheel in-house.

While companies have been slow to awaken to the need for training, current circumstances show a change in attitudes, IS managers and trainers agree.

"Fifteen years ago, I was constantly being asked to prove the value of *my existence*," Podeszwa says. "Now, every corporation knows that they have to provide high-quality training — or they will fall behind their competitors."

Part II will take a look at cost-justification methods that IS trainers and managers can implement.

LaPlante is a free-lance writer based in Palo Alto, Calif.

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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

FROM HOLD TO BUY: *GME*/Electronic Data Systems, Inc. (by Prudential-Bache Securities, Inc.). Reason: EDS is the outsourcing vendor of choice; stock will top its recent high of 40 within a year.

FROM OUTPERFORM TO AGGRESSIVE BUY: Aldus Corp. (by Montgomery Securities). Reason: New version of Pagemaker 4.0 for Windows is impressive; stock is expected to jump into the mid-30s within six months.

FROM BUY TO HOLD: Systems Center, Inc. (by Alex. Brown & Sons, Inc.). Reason: Fourth-quarter profits will fall short of estimates because of low revenue from new release of Net/Master, network and systems management software.

INDICATORS

The Dow Jones industrial average leapt just over 122 points — nearly 4.9% — last week, closing Thursday at 2,623.51. The *Computerworld* Stock Index, meanwhile, shot up 7.7% to 29.55 by Thursday, an increase of 2.11 points for the week.

GUEST SPEAKER

David Bayer, analyst, Montgomery Securities, San Francisco:

"Earnings reports from microcomputer software vendors look good, especially compared with the rest of the industry. **Borland International, Inc.** has stolen market share from **Lotus Development Corp.** and is expected to release Quattro Pro for Windows in the second quarter.

"The only question mark regarding earnings goes to Lotus. It'll have a tough first half in 1991 until 1-2-3 for Windows comes out, but it will not relinquish its leadership role in the spreadsheet market. Ultimately, the customer will have three very good spreadsheets to choose from: 1-2-3, Excel and Quattro Pro."

ANALYSIS IN BRIEF

Turnaround at **Ask Computers Systems, Inc.** will take several more quarters as the acquisition of **Ingres Corp.** smoothes out. Lotus stock may appear to be relatively cheap, but do not buy it now. Its Freelance Plus may eventually compete well among business graphics packages for Windows, but it will not ship until mid-1991. Lotus must release a Windows-compatible version of 1-2-3 as soon as possible to draw buyers from **Microsoft Corp.**'s Excel 3.0 for Windows.
— *Prudential-Bache, Software Snapshots, Dec. 28, 1990.*

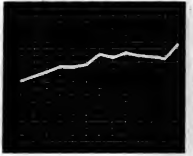
Microcomputers and semiconductors have avoided a slowdown so far, mainly because of growing foreign sales and new product cycles. Firms selling notebook computers, file servers or **Intel Corp.** I486-based systems look good.

Intel and other semiconductor companies that are allied with major personal computer vendors should report positive earnings for the fourth quarter.

This year will bring a shakeout among disk-drive makers. **Seagate Technology, Inc.** appears to be taking market share from competitors **Western Digital Corp.** and **Maxtor Corp.**
— *Microcomputers, Semiconductors: What's Up, Tech?, Bear Stearns & Co., Inc., Jan. 11, 1991.*

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

• Technology stocks followed other frenzied markets higher last week. IBM shot up 7⅜ points to 115¾ after reporting better-than-expected fourth-quarter profits. Digital Equipment Corp. picked up 5⅞ points, closing at 61½.
• Dell Computer Corp. and Borland International, Inc. reached new heights. Borland soared 9¼ points to close at 39⅛; Dell gained 3 points to 20⅜.
• AT&T said it has the NCR Corp. shareholder majority needed to call a special meeting of NCR's board of directors. AT&T added 2⅜ points to 31⅜. NCR added 1⅝ to 86⅝ after reporting that fourth-quarter earnings were lower than last year.
• Motorola, Inc. was among the few losers last week after posting quarterly profits below estimates, sliding 1⅞ points to 45⅞. Wang Laboratories, Inc. Class B shares also fell, slipping ⅛ of a point to 2½ after the firm said it would cut 500 employees.

Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, JANUARY 17, 1991

TOP PERCENT GAINERS	
Alloy Computer	100.64
Borland Int'l	37.89
Compression Labs	28.38
Micropolis Corp.	37.50
Aldus Corp.	26.92

TOP PERCENT LOSERS	
Computer Automation Inc.	-27.33
Capital Associates	-17.51
Printronix Inc.	-17.14
Oracle Systems	-16.08
Mentor Corp.	-13.44

TOP DOLLAR GAINERS	
Borland Int'l	10.75
Matsushita Elect.	10.50
Microsoft Corp.	10.00
IBM	8.88
Digital Equipment	5.88

TOP DOLLAR LOSERS	
Motorola Inc.	-3.13
Printronix Inc.	-1.50
Oracle Systems	-1.00
Sage Software Inc.	-0.75
Sungard Data Sys.	-0.75

Communications and Network Services — Up 5.7

Exch	52-Week Range			Jan. 17 Close	Wk Net Change	Wk Pct Change
OTC	10.00	6.88	6COM Corp.	8.00	0.13	0.16
NYS	69.75	52.50	American Info Techs Corp.	66.88	2.50	3.94
NYS	44.13	29.00	AT&T	31.25	2.00	6.84
OTC	1.63	0.94	Artel Communication Corp.	1.38	0.13	10.00
NYS	60.25	38.80	Bell Atlantic Corp.	52.25	3.75	7.73
NYS	57.63	40.00	BellSouth Corp.	53.38	1.75	3.39
OTC	16.38	8.25	Compression Labs Inc.	11.88	2.63	28.38
NYS	36.38	23.38	Contel Corp.	36.16	1.50	4.33
OTC	4.38	1.75	Dataswitch Corp.	4.0	0.63	18.52
NYS	28.75	6.88	Digital Comm Assoc	16.00	0.50	4.00
OTC	20.50	12.25	Dynatech Corp.	19.25	0.63	3.38
OTC	12.88	6.80	Fibronics Inc.	7.63	0.75	10.91
OTC	4.38	1.75	Gandalf Technologies Inc.	2.50	0.06	2.54
NYS	4.75	1.83	General Datacomm Inds.	2.25	0.12	5.88
NYS	34.13	23.50	GTE Corp.	29.63	1.38	4.87
OTC	6.25	0.88	Infotron Systems Corp.	1.00	0.00	0.00
NYS	60.88	40.25	ITT Corp.	46.25	0.16	4.01
OTC	44.13	18.00	MCI Communications Corp.	19.88	1.38	7.43
OTC	21.00	2.75	Microcom Inc.	3.75	-0.25	-6.25
NYS	34.88	5.00	Network Equipment Tech.	8.63	0.18	2.27
OTC	14.63	4.00	Network General	8.50	1.00	13.33
OTC	15.25	8.00	Network Systems Corp.	13.13	0.88	7.14
NYS	29.63	22.16	Northern Telecom Ltd.	27.63	0.50	1.84
OTC	37.88	13.75	Novell Inc.	37.88	7.13	23.17
NYS	89.50	67.13	Nynex Corp.	70.00	1.63	2.38
NYS	47.88	38.25	Pacific Telesis Group	43.00	1.75	4.24
ASE	6.25	4.75	Penril Corp.	8.88	1.13	14.52
NYS	35.16	8.88	Scientific Atlanta Inc.	12.88	0.88	3.13
NYS	69.50	47.25	Southwestern Bell Corp.	53.38	1.13	0.15
NYS	46.38	20.63	United Telecom	22.38	0.25	1.13
NYS	40.50	32.38	US West Inc.	36.88	1.13	3.16

Computer Systems — Up 7.29

Exch	52-Week Range			Jan. 17 Close	Wk Net Change	Wk Pct Change
OTC	3.75	0.88	Alliant Computer Sys.	1.00	0.00	0.00
ASE	16.88	10.00	Amdahl Corp.	14.25	1.50	11.75
OTC	51.25	24.25	Apple Computer Inc.	51.25	6.00	13.28
OTC	13.88	4.25	Archive Corp.	8.50	0.13	1.88
NYS	7.00	3.88	Bolt, Beranek & Newman	5.00	0.38	8.11
NYS	11.88	4.50	Commodore Int'l	11.25	1.00	9.75
NYS	67.88	68.50	Compaq Computer Corp.	63.25	8.83	15.79
OTC	4.25	3.13	Computer Automation Inc.	0.50	-0.16	-27.33
NYS	31.63	6.75	Control Data Corp.	8.75	1.63	22.31
NYS	20.88	8.38	Convex Computer	11.75	1.38	13.25
NYS	51.25	20.00	Cray Research Inc.	35.25	4.63	16.10
NYS	13.25	3.50	Data General Corp.	4.38	0.88	6.38
NYS	4.00	0.75	Datapoint Corp.	1.63	0.00	0.00
OTC	20.88	4.83	Dell Computer Corp.	20.38	4.16	25.88
NYS	86.16	45.50	Digital Equipment Corp.	61.50	5.88	10.88
NYS	36.13	13.75	Harris Corp.	20.25	0.88	1.88
NYS	50.88	24.88	Hewlett-Packard Co.	35.50	4.75	15.45
NYS	123.13	95.00	IBM	115.75	8.88	8.80
OTC	14.00	8.00	Information Int'l	8.00	-0.16	-1.94
OTC	23.50	10.50	Intergraph	14.88	1.13	8.18
NYS	3.88	0.88	MAI Basic Four Inc.	1.00	0.00	0.00
NYS	162.75	114.00	Matsushita Electronics	126.50	10.50	9.09
OTC	26.00	9.00	Mentor Graphics Corp.	14.00	0.00	0.00
NYS	92.88	44.50	NCR Corp.	86.63	1.63	1.91
OTC	35.50	11.00	Pyramid Technology	13.88	1.88	15.63
OTC	34.00	10.00	Sequent Computer Sys.	12.00	0.50	4.88
NYS	40.88	16.00	Silicon Graphics	27.13	2.63	10.71
NYS	29.00	14.00	Stratus Computer Inc.	23.50	0.75	13.25
OTC	37.25	16.00	Sun Microsystems Inc.	26.25	4.50	20.92
NYS	30.16	8.88	Tandem Computers Inc.	10.63	-0.38	-3.41
NYS	39.50	23.50	Tandy Corp.	26.13	1.00	3.98
OTC	60.80	6.75	Teradata	12.25	1.38	11.88
NYS	6.00	1.88	Ultimate Corp.	2.00	0.13	6.67
NYS	17.13	1.75	Unisys Corp.	2.75	0.00	0.00
ASE	6.25	2.00	Wang Labs Inc. (b)	2.50	0.00	0.00

Software & DP Services — Up 5.80

Exch	52-Week Range			Jan. 17 Close	Wk Net Change	Wk Pct Change
OTC	50.75	17.00	Adobe Systems Inc.	33.50	2.50	8.06
OTC	33.00	15.50	Aldus Corp.	33.00	7.00	26.92
OTC	18.75	10.50	American Mgmt. Systems	15.25	1.50	8.88
OTC	16.25	7.50	American Software Inc.	14.50	1.75	13.73
NYS	4.50	1.88	Anacomp Inc.	2.13	0.00	0.00
OTC	23.50	10.00	Analysts Int'l	13.25	0.50	3.92
OTC	15.13	4.88	Ashton Tate	5.88	0.25	4.44
OTC	10.25	4.00	ASK Computer Sys.	4.75	-0.63	-11.63
NYS	60.25	46.25	Auto Data Processing	54.50	3.50	6.88
OTC	60.25	32.00	Autodesk Inc.	48.88	2.13	4.40
OTC	28.50	12.00	BGS Systems Inc.	20.50	0.25	1.23
OTC	36.88	17.75	BMC Software Inc.	33.38	5.88	20.88
OTC	21.50	11.00	Boole & Babbage Inc.	12.00	-0.25	-2.04
OTC	39.13	10.63	Borland Int'l	39.13	10.75	37.88
NYS	11.88	0.94	Businessland Inc.	1.00	0.00	0.00
OTC	10.25	4.25	Cognos Inc.	6.00	-0.10	-1.37
NYS	16.38	4.88	Computer Associates	7.50	0.50	7.14
OTC	17.25	7.75	Computer Horizons	16.50	-0.25	-1.88
NYS	54.00	36.75	Computer Sciences	52.25	3.38	6.91
NYS	12.25	6.63	Computer Task Group	8.25	0.13	1.54
OTC	25.25	14.25	Comshare Inc.	16.00	1.00	6.67
OTC	18.00	6.75	Corporate Software	8.50	0.88	4.00
NYS	41.88	24.88	General Motors (cl e)	41.50	4.75	12.93
OTC	18.25	7.25	Goal Systems Int'l	12.25	2.00	19.51
OTC	4.75	1.88	Hogan Systems Inc.	2.38	0.31	16.16
OTC	6.75	6.00	Index Technology	7.75	-0.25	-3.13
OTC	18.63	7.75	Information Resources	10.50	0.63	6.33
OTC	17.50	3.31	Informix Corp.	3.31	-0.31	-8.61
OTC	7.88	1.38	Intellicorp Inc.	1.81	0.06	3.60
OTC	8.00	2.50	Interleaf Inc.	2.38	-0.16	-6.26
OTC	27.88	10.00	Knowledgeware Inc.	24.00	3.25	15.66
OTC	31.00	16.75	Legent Corp.	30.25	2.75	10.00
OTC	38.25	12.50	Lotus Development	18.38	1.63	8.70
OTC	69.25	13.63	Micrografx	24.00	2.75	12.94
OTC	94.00	43.63	Microsoft Corp.	84.00	10.00	13.51
NYS	11.25	4.00	On Line Software Int'l	3.75	0.38	8.88
OTC	28.38	4.88	Oracle Systems	6.63	-1.00	-15.08
NYS	17.88	7.00	Pansophic Systems	8.13	0.38	4.29
OTC	6.38	1.88	Phoenix Technologies	3.63	0.00	0.00
NYS	43.50	20.00	Policy Management Sys.	41.50	1.25	3.11
NYS	23.63	11.50	Reynolds & Reynolds	16.88	0.88	5.47
OTC	18.13	7.00	Sage Software Inc.	7.25	-0.75	-9.38
OTC	22.25	14.50	SEI Corp.	18.50	0.25	1.37
OTC	18.38	12.00	Shared Medical Systems	15.50	1.63	11.71
OTC	28.00	12.00	Software Publishing Corp.	24.88	3.63	17.06
NYS	11.00	5.50	Sterling Software	6.00	0.25	4.82
OTC	26.00	9.50	Sungard Data Sys.	11.00	-0.75	-6.38
OTC	32.50	16.00	Symantec Corp.	30.50	4.75	17.12
NYS	24.88	4.50	System Center Inc.	5.00	-0.38	-6.98
OTC	36.75	12.75	System Software Assoc.	27.25	0.25	0.93
OTC	27.38	4.75	Walker	8.63	0.88	11.29

Semiconductor — Up 8.1

Exch	52-Week Range			Jan. 17 Close	Wk Net Change	Wk Pct Change
NYS	29.88	17.38	Advanced Micro Devices	20.02	-0.63	-3.03
NYS	8.63	6.50	Analog Devices Inc.	7.13	0.38	5.88
OTC	33.88	5.25	Chips & Technologies	8.25	1.00	13.79
OTC	52.00	28.00	Intel Corp.	42.00	2.63	6.45
NYS	13.00	6.13	LSI Logic Corp.	6.88	0.50	8.89
NYS	16.38	6.75	Micron Technology	11.88	1.38	10.67
NYS	88.25	46.88	Motorola Inc.	45.88	-3.16	-6.39
NYS	8.88	3.00	National Semiconductor	5.00	0.88	21.21
NYS	44.00	22.88	Texas Instruments	40.25	1.50	3.87
OTC	12.25	3.00	VLSI Technology	8.88	0.88	17.39
ASE	14.88	4.00	Western Digital Corp.	4.50	0.16	3.88

Peripherals & Subsystems — Up 12.16

Exch	52-Week Range			Jan. 17 Close	Wk Net Change	Wk Pct Change
OTC	2.38	0.08	Alloy Computer Prod.	0.31	0.16	100.64
OTC	2.50	0.88	Apertus Technologies	1.44	0.19	15.04
OTC	40.00	12.38	AST Research Inc.	40.00	7.88	24.51
OTC	24.00	7.50	BancTec Inc.	3.25	0.50	6.45
ASE	7.63	3.16	Cognitronics Corp.	7.00	0.25	3.70
NYS	31.25	12.50	Conner Peripherals	26.50	4.16	18.44
ASE	22.00	7.00	Dataram Corp.	8.63	0.00	0.00
NYS	10.00	3.88	EMC Corp.	10.00	1.38	15.94
NYS	43.88	38.75	Eastman Kodak Co.	39.75	0.38	0.88
OTC	9.50	4.38	Emulex Corp.	5.63	0.25	4.88
OTC	34.50	14.00	Evans & Sutherland	19.25	2.00	11.88
OTC	6.25	3.13	Iomega Corp.	6.50	0.88	11.88
OTC	18.50	8.00	IPL Systems Inc.	16.25	2.00	16.08
OTC	2.16	0.16	Masstor Systems	0.44	-0.03	-6.61
OTC	17.00	3.88	Maxtor Corp.	3.63	-0.88	-19.44
OTC	10.25	3.88	Micropolis Corp.	9.25	2.00	27.59
NYS	91.88	73.63	3M Corp.	85.13	0.63	0.44
OTC	14.50	6.00	Printronix Inc.	7.25	-1.50	-17.14
NYS	21.20	8.50	QMS Inc.	16.50	2.38	16.75
OTC	25.75	8.88	Quantum Corp.	20.50	2.88	16.31
NYS	8.88	4.88	Recognition Equipment	5.13	0.25	5.10
OTC	6.88	4.00	Rexon Inc.	5.88	0.25	4.44
OTC	19.75	6.63	Seagate Technology	13.00	1.75	15.56
NYS	26.88	11.00	Storage Technology	23.50	3.63	18.24
OTC	4.00	0.63	Tandon Corp.	1.94	0.12	6.88
NYS	18.13	11.63	Tektronix Inc.	19.88	1.00	5.50
OTC	0.63	0.16	Televideo Systems	0.22	0.03	16.40
NYS	66.75	29.00	Xerox Corp.	42.25	3.75	9.74

Leasing Companies — Up 3.46

Exch	52-Week Range			Jan. 17 Close	Wk Net Change	Wk Pct Change
OTC	10.50	6.88	Amplicon Inc.	9.00	1.00	12.50
OTC	4.38	0.31	Capital Associates	0.44	-0.09	-17.81
NYS	28.50	14.63	Comdisco Inc.	23.00	2.00	12.20
OTC	19.25	9.25	LDI Corporation	11.75	-0.25	-2.08
OTC	6.80	2.25	Selectterm Inc.	2.75	0.50	22.22

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NEWS SHORTS

And don't pass Go

Claris Corp. President and Chief Executive Officer Bill Campbell announced last week that he is leaving the Apple Computer, Inc. software subsidiary to take on the same titles at Go Corp., effective today. At Go, a Foster City, Calif.-based developer of pen-based computer technology, Campbell will succeed S. Jerrold Kaplan, who was named chairman of the board.

Bush pushes telecommuting

President Bush last week issued another in a series of messages that promote telecommuting [CW, Nov. 26]. In a letter to the Pacific Telecommunications Council's conference in Honolulu, the president noted that technology can provide people with "a more flexible workplace." White House aide William Eagle said that more presidential endorsements of telecommuting are likely to appear in the forthcoming National Energy Strategy document and at other conferences this year.

General Motors audits PCs

General Motors Corp. has finished an audit of the personal computers at its corporate headquarters. GM chose its corporate headquarters as the first site for a companywide internal audit program based on the Software Publishers Association's Spaudit package, to make sure the corporation is in line with licensing policies. GM tested 4,000 PCs with preliminary results showing few systems with illegally made copies. GM will begin testing other sites next month.

Building DOS/Mac bridge

A Palo Alto, Calif.-based start-up is working to span the gap between the DOS world and Apple Macintosh users. Unerland Software has begun shipping the IAC Toolkit, which is a development tool designed for "interapplication communication" of Macintosh and Microsoft Corp. Windows environments.

Pesatori heads Zenith Data

Zenith Data Systems pulled off a bit of a surprise last week with its choice of Enrico Pesatori, former head of North American operations at Ing. C. Olivetti & Co., as its new president and CEO. Analysts had expected parent company Groupe Bull to replace former Zenith Data CEO and President John Frank with someone from within its ranks or an executive at a U.S. PC maker. Pesatori, 50, has been at Olivetti for 21 years.

Novell signs vendors

Four vendors — IBM, Netframe Systems, Inc., Data General Corp. and AST Research, Inc. — announced last week that they joined Novell, Inc.'a Strategic Engineering Support program. Through the program, the vendors work more closely with the networking firm to ensure compatibility between Novell's Netware products and their hardware. The program involves testing Novell products before they are released.

Norman expands role at Racal

Racal-Milgo President James K. Norman has been named president of $550 million Racal Data Communications, U.S., the domestic parent of four Racal data communications firms. Norman will reportedly take on operational responsibility for the four U.S. companies, which include Racal-Milgo, Racal Interlan, Racal Quanta and Racal-Milgo Skynetworks. He will retain his role as president of Sunrise, Fla.-based Racal-Milgo, a wide-area networking company.

Software Publishing spins off PFS

It must have liked the cut of the PFS jib. Spinnaker Software Corp. in Cambridge, Mass., will purchase the PFS product line from Software Publishing Corp., based in Mountain View, Calif. Software Publishing will receive approximately 16% of Spinnaker's stock in exchange for the product line as well as royalties on PFS sales. Spinnaker has plans for Windows 3.0 applications to be marketed under the PFS name.

'A la carte' broadband to be served at Comnet

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — Several products and services designed to support broadband networking a la carte — providing users with the ability to call up the bandwidth they need when they need it at a price commensurate with their use — are expected to be introduced next week at Communications Network '91 (see story below).

The offerings are geared to applications such as videoconferencing, network backup and local-area network interconnections, which require large amounts of bandwidth for short periods of time. While the major carriers have produced a growing flock of switched digital high-speed services recently, users complained that so far, such offerings are too pricey, are available only in limited areas and take too long to set up.

Charles Schwab & Co. is very interested in "on-demand, multi-megabit/sec. carrier services" that could provide backup links to connect users to a backup data center, said John Payne, a telecommunications analyst at the investment firm. "The problem is that current offerings are too expensive. You have to reserve the bandwidth and pay a monthly cost and give the carrier at least two hours notice," he said.

What Schwab users really need is the ability to call up 45M bit/sec. bandwidth within 30 minutes "and really pay on a usage basis," Payne said.

Meeting needs

Exhibitors at Comnet are expected to respond to the needs of companies such as Schwab with the following announcements:

- Teleos Communications, Inc. and Ascend Communications, Inc. will display rival boxes that are said to amalgamate multiple 56K bit/sec. switched links into Integrated Services Digital Network and T1 pipelines.
- MCI Communications Corp. is reportedly preparing an enhanced version of its Digital Reconfiguration Service, which will promise users the ability to call up between 56K and 1.5M bit/sec. of dedicated bandwidth within five minutes. A typical wait for existing on-demand services from MCI and others has been up to 15 minutes.

MCI also said it will announce a global networking service that will combine a variety of its offerings, including those of Infonet, in which MCI has a 25% stake.

- British Telecommunications PLC subsidiary BT Tymnet is expected to lay out its strategy for bringing out frame relay and other broadband switched digital services. Frame relay is said to support speeds of up to 2M bit/sec. over a switched network, but Tymnet "was very careful to say that they are not limiting themselves to frame-relay technology" in their broadband offerings, said Berge Ayvazian, an analyst The Yankee Group in Boston.
- AT&T is expected to introduce its switched T1 service, which the company said would be out sometime in the first quarter of this year.
- Network Systems, Inc. announced a series of LAN-to-LAN routers and bridges that are said to support throughput of 50,000 packet/sec. over a Fiber Distributed Data Interface connection and 15,000 packet/sec. over an Ethernet or long-distance link. The whole product line will support frame relay 90 days after a carrier introduces frame-relay services, a Network Systems spokesman said.

Show aimed at LAN-hungry buyers

BY JOANIE M. WEXLER
CW STAFF

The internetworking market is expected to thrive in an otherwise fragile economy, and vendors exhibiting at next week's Communications Networks '91 event in Washington, D.C., said they are filling the bill with next-generation mousetraps.

Start-up firm Coral Network Corp. in Marlboro, Mass., for example, is betting product differentiation against vendor longevity with its firstborn offering, the Broadband Enterprise Switch. The fiber-based, modular device bundles local- and wide-area networking interfaces, bridging, routing and packet- and circuit-switching technologies into one system.

Coral's product reportedly allows LANs — including the 100M bit/sec. Fiber Distributed Data Interface (FDDI) — to communicate at full network speeds with no throughput degradation because of its 800M bit/sec. bus architecture. It will accommodate current and imminent wide-area transmission technologies such as T3 (45M bit/sec.), T1, fractional T1, frame relay and Synchronous Optical Network by August 1991, the company said.

The $20,000 to $100,000 switch can also reportedly be configured for any degree of fault tolerance.

Rosemary Cochran, a principal at Vertical Systems Group, a Dedham, Mass.-based consultancy, said while vendor stability is an issue with users, Coral is competing in the router market where "most of those vendors are small start-ups, as well."

> "WE'RE SIMPLIFYING the network and not requiring users to spend an extra $10,000 for [LAT] gateway functionality."
>
> JEFF PAINE
> CISCO SYSTEMS

Internetworking innovations from Proteon, Inc., Cisco Systems, Inc. and Network Systems Corp. will also emerge at next week's show.

Proteon said it plans to unveil a reduced instruction set computing-based bridge/router based on the Advanced Micro Devices, Inc. 29000 microprocessor. The Pronet CNX line, which the vendor said routes more than 100,000 packet/sec., was also created to handle emerging high-speed applications over T3, FDDI and metropolitan-area networks.

Cisco said it has bundled a software gateway option into its IGS multiprotocol bridge/router. The module — which will replace the vendor's $10,925 stand-alone gateway — translates Digital Equipment Corp.'s notoriously "unroutable" Local Area Transport protocol into Transmission Control Protocol/Internet Protocol or X.25 so that it can be routed.

"We're simplifying the network and not requiring users to spend an extra $10,000 for [LAT] gateway functionality," said Jeff Paine, Cisco's manager of marketing communications. The IGS router with the translator option costs $6,595.

Network Systems said it is announcing a bridge/router line with a 400M or 800M bit/sec. chassis that supports a combination of interfaces, including up to four FDDI links.

These and other products will address the 42% growth rate predicted by Boston-based consultancy The Yankee Group for the 1991 LAN-to-LAN communications market. The firm places internetworking investments second only to network management in user firms' communications budgets.

U.S. high-tech weapons pass trial by fire

Sophisticated armaments reported to have performed well in early days of war with Iraq

BY JAMES DALY
CW STAFF

Despite last week's Iraqi missile strike against Israeli cities, the devastating effectiveness of the armaments employed by U.S. military forces in Operation Desert Storm quelled long-standing fears that reliance on technology would lead to tragic foul-ups under real battle conditions.

"Our technological superiority quickly outclassed the Iraqis' ability to defend themselves; there's no doubt about it," said Bill Oliver, a researcher at the Center for Defense Information in Washington, D.C.

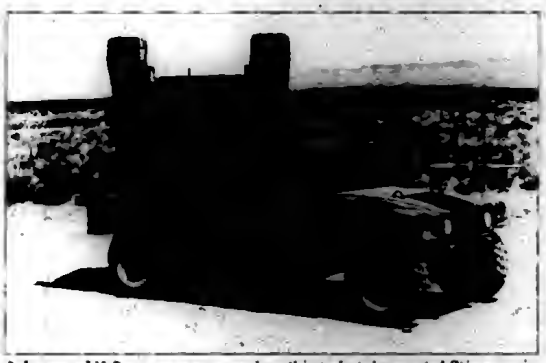
The first wave of late-night attacks against Baghdad — reportedly led by cruise missiles and radar-evading F-117A Stealth fighters — highlighted the U.S. Air Force's ability to technologically outfox Iraqi planes, which reportedly do not have the equipment needed for effective nighttime air-to-air battles.

Night warfare is becoming one of the Pentagon's favored military tactics: The military spent $235 million on night-vision equipment in fiscal 1990, according to research firm Frost and Sullivan, Inc. in New York.

Critics have long argued that the Pentagon's supersophisticated armaments have become so complicated that they have outgrown the ability of pilots, soldiers and sailors to use them. The Stinger anti-aircraft missile, for instance, requires its gunner to complete 18 steps before it can lock onto its target.

This time around, however, there was nothing but praise for the equipment. "The high-tech weapons did their job and did it very effectively," said the Strategic Air Command's Maj. Robert Staal at Offut Air Force Base in Bellevue, Neb.

That was borne home to U.S. television viewers late last week when shortly after reports of Iraqi missiles landing in Tel Aviv and Haifa in Israel came word — and later video footage — of a U.S. Patriot air-defense missile successfully intercepting a Scud missile aimed at forces in the Dhahran area of Saudi Arabia.



Advanced U.S. weaponry, *such as this pedestal-mounted Stinger missile system, reportedly functioned well in early attacks on Iraq*

The ability to effectively and easily use their weapons is not the only challenge facing Operation Desert Storm troops. The whirling sands of the Middle East can quickly clog moving parts, create electrical disturbances and limit the effectiveness of even the most advanced gear.

Military personnel also face a foe brimming with technical acumen. Analysts said Iraq has some very sophisticated weapons, and it was unclear in the first days of the war how much the U.S. and its "coalition" allies had been able to eliminate. Individual units of Iraq's air-defense system are reportedly armed with sophisticated missiles and radar, but its overall effectiveness is undermined by inadequate communications.

Peacenet usage soars as war erupts in Iraq

BY JEAN S. BOZMAN
CW STAFF

MENLO PARK, Calif. — As the first reports of U.S. attack on Baghdad began filtering in last Wednesday, the news flashed across the screens of Peacenet, a computer network linking peace organizations around the world.

During the first few minutes after the attack was announced, activity on the network node became so intense, there was a shutdown of the system for several minutes.

"Usage has gone up dramatically in recent weeks, and it's really taxing the system," explained Steve Fram, technical director at the Institute for Global Communications (IGC) in San Francisco, which funds Peacenet.

The system is surprisingly small: There is just one Intel Corp. 1486-based supermicrocomputer at the heart of this data-processing center. That supermicrocomputer, running AT&T's Unix System V Release 3.2, is loaded with 16M bytes of memory, 16 communications ports and 2.5G bytes of hard-disk storage.

Peacenet, founded in 1986, links Unix machines and personal computers based in 50 countries, stretching from the U.S. to Brazil to Australia.

Last week, war advisories on Peacenet's hundreds of electronic-mail "conferences" were posted by users in the U.S., UK and Canada. "The computer breaks the geographic barrier," said Jo Anne Scott, a Peacenet volunteer. "It alleviates the isolation people may feel in their own communities."

The California network exchanges information with other Unix-based networks, such as Usenet, communicating over X.25 networks. These data exchanges take place several times daily via automatic dial-ups.

"We're acting like a public utility," said Scott Weikert, who manages Peacenet's data center here. "Peace groups all around the world call us on high-speed modems to post their information on our bulletin boards, and we try to keep up with them."

Keeping up will indeed be a challenge, because Peacenet's central node can only handle 30 logged-on users at a time. To match last week's unprecedented user demand, Peacenet bought additional capacity with U.S. Sprint Communications Co., according to IGC executive director Geoff Sears.

The computer age seems to have brought lasting change to the peace movement, which operated largely by word of mouth during the Vietnam War. In June 1989, the same system was used by Chinese students in the U.S. to send messages to Beijing, China, at the time of the bloody Tiananmen Square protests, Sears said.

IS sites

FROM PAGE 1

the materials systems group in Dhahran, Saudi Arabia.

"We have a disaster-recovery plan which calls for the relocation of database information to various sites around the kingdom," Scarritt said. "But late last week, we added a new out-of-kingdom location somewhere in Germany."

In a worst-case scenario, the group's information systems duties could be conducted from Houston or the Germany location, Scarritt said.

While Aramco security in the Dhahran compound has been increased since the crisis began Aug. 2, "we are on a very high state of alert right now," Scarritt noted. "Until we see how everything is going, everyone is staying close to home and keeping inside most of the time."

Leading up to the United Nations deadline of Jan. 15, the Aramco data centers experienced little or no interruption in normal operations. "Things have been operating every bit as well if not better than they were a number of months ago," said Ted Valentiner, a computer user in his role as capital construction project coordinator at Aramco.

Despite the interception of an Iraqi Scud missile launched at Dhahran late Thursday, there had been no reports that Aramco would not resume business here as usual following the weekend, Valentiner said.

The main data center in Dhahran, 170 miles south of the Kuwait border, had not been considered a risky location, according to an Aramco spokesman. However, the company does have a contingency plan for evacuating employees from areas hit by hostilities, he said.

While some expatriates have left their IS posts and Middle Eastern homes for the safety of other regions, many have reportedly elected to stay on.

This expatriate loyalty is difficult to explain, but these "are folks who were born and raised there and have had kids there," said Peter Fingar, director of computing and information services at the University of Tampa in Florida. Fingar spent 15 years working in the Middle East and has about two dozen close friends in the area.

While the U.S. ambassador in Bahrain reportedly saw little risk for U.S. citizens there, the British and French embassies urged their countrymen to depart. Attrition has been high at Bahrain Petroleum, which is predominantly staffed by British and Asian nationals. About 20% of the IS staff alone has left since August, Ragel said.

Those who have stayed behind are growing more concerned as Iraq flexes its military muscle. In Dhahran, "The incoming missile has obviously increased tension," Valentiner said. "The assumption has been that the missiles would be targeted for military facilities, but that wasn't the case."

Wall Street cheers

Wall Street girded against possible terrorist attacks and wild trading swings as the world waited for war to break out in the Persian Gulf.

WEDNESDAY: Rumors of military engagement prompted strict travel advisories and extra safety precautions at New York finance houses, along with plans to briefly halt trading to dampen any sudden surges. Analysts reported the sudden proliferation of guards in the lobbies of their buildings and beefed-up identification requirements for all visitors.

THURSDAY: The Dow Jones industrial average rocketed 114.6 points on exceptionally heavy trading; volume reached 318,890,000 shares. The rally marked the second-largest single-day point gain in U.S. stock market history.

The New York Mercantile Exchange, which handles the trading of oil futures contracts, reportedly implemented circuit breakers — provisions set to suspend trading for one hour should oil prices alter by $7.50 per barrel. Oil prices, in fact, barreled down $10.56 — the biggest one-day drop ever.

FRIDAY: In light of a widening war, gold prices soared, bonds dropped and the Dow Jones average was up again by 26 points.

NELL MARGOLIS

Officevision

FROM PAGE 1

contacted last week said they continue to believe that the concept of SAA remains sound. However, some suggested that IBM has all but lost its chance to become a desktop office system provider because of its Officevision woes.

Others point to the very long-term goals of SAA and IBM's stated determination to make it fly. "I would not expect any miraculous expediting now that it's there, but it fits with their general SAA direction," said Paul Hessinger, a consultant at Computer Task Group.

Can't wait any longer

Some users are clearly becoming irritated with the series of delays announced by IBM. "We have bought into the SAA concept, but we and a lot of other companies have issues that have to be addressed today, and we can no longer wait for IBM," said a Midwest information systems manager at a Fortune 500-class firm that has invested heavily in IBM mainframe and midrange equipment.

IBM restated last week that it will provide an Officevision status report in the second quarter but would not say if it will provide shipment schedules for the long-awaited Release 2, which was to provide the critical OS/2 direct-connect capability. More recently, IBM has been quietly shipping Officevision updates to host customers. The updates are called Release 2 but do not include the OS/2 direct-connect feature.

Despite IBM claims that it has approximately 1 million Officevision users, analysts said the majority of these are users who merely upgraded from Application System/400 Office and Professional Office System (Profs), indicating that IBM has failed to attract a substantial number of new accounts to the Officevision concept.

Tom Aser, IBM's director of marketing for Programming Systems, rebutted analysts' opinions that Wheeler took on the additional responsibility because the Applications Solutions Division stumbled in its delivery of the software. Aser claimed that Programming Systems has "felt all along that Officevision belonged here."

Yet IBM is currently conducting a survey of attitudes toward office integration, according to a developer who took part in the survey. One of the questions he was asked was: "Has Officevision hurt SAA's chance of adoption?"

Whether or not that is the case, opinion among users and analysts seemed unanimous that Wheeler can only help Officevision. "Earl Wheeler has a record of delivering the essential components of what others have promised," said George Sekely, vice president of computers and communications at Canadian Pacific Ltd., who said he has known Wheeler since the 1960s. "He's a no-nonsense guy who concentrates on reality," he said.

The users best served by and most taken with Officevision tend to be MVS and Profs users. But however tempting, even some of those types of users contacted last week termed the Officevision suite of applications "immature" and of more smoke than substance.

Turned off

Users concerned with personal computer implementation are generally even more turned off, according to industry analysts. Robert Holmes, a computer analyst at Southern California Gas Co., said his primary gripe with Officevision is the lack of support for Microsoft Corp.'s Windows. "We don't want to have to switch all our workstations to OS/2 just to use Officevision 2.0," he said.

Beyond these user complaints, Officevision problems are a symptom of what may be a bigger problem for IBM in delivering the grand-scale SAA solutions as real products in a timely fashion.

"They are attemping something that has never been done before," said George Schussel, president of Digital Consulting, Inc. in Andover, Mass. IBM, he said, "can't get away from the absolute bare-bones fact that these are very expensive solutions, especially if they aren't real and provable yet."

Past time

Officevision, particularly the local-area network segment, is plagued by design flaws, sluggish performance and delivery problems, according to industry analysts.

Release 2 of Officevision platforms was — as Officevision/2 LAN still is — late. What IBM has failed to deliver users said they can get from other vendors.

IBM is missing the boat by not meeting the needs of LAN users, said Judith Hurwitz, editor of "Unix in the Office" at Patricia Seybold's Office Computing Group in Boston.

Both Seybold and Forrester Research, Inc. recently recommended that users not tie themselves to Officevision. Instead, those who are not committed to a host-centric strategy should look elsewhere or at least proceed with extreme caution, Hurwitz and Forrester analyst Stuart Woodring agreed.

The real value for these users lies in the so-far unsuccessful implementation of Officevision LAN. However, Woodring predicted, it will be 1992 before users will be able to derive massive benefits from Officevision LAN.

Hurwitz noted that "after spending a few minutes with OV/2 running on OS/2 Version 1.2, we quickly understood why IBM pulled the release. It was unacceptably slow and dysfunctional."

What are the alternatives? Hurwitz and Woodring cited the following options: Hewlett-Packard Co.'s New Wave, NCR Corp.'s Cooperation, Lotus Development Corp.'s Notes and AT&T's Rhapsody. "It will be hard for IBM to compete with these innovative applications," Hurwitz said.

"IBM must bite the bullet and re-architect and rebuild the product in a pure object-oriented language like Digitalk's Smalltalk or a hybrid language like C++," Woodring said.

Additionally, Woodring said, Officevision must be extended to work through non-IBM environments. Forrester said IBM is trying to address this through a rollout of clients through 1992: Microsoft Corp.'s Windows 3.0 in the first half of 1991, Unix (Open Software Foundation/Motif) in the second half of 1991, Novell, Inc.'s Netware in 1991 and an Apple Computer, Inc. Macintosh client in 1992.

PATRICIA KEEFE

Windows

FROM PAGE 1

provide support for two graphical user interfaces on the front end — OS/2's P sentation Manager and Windows — on top of a back end consisting of the 32-bit OS/2 kernel. But as Microsoft wrote to developers, "clearly we place the Windows application programming interfaces at the center of our strategy."

Furthermore, Microsoft suggested in its memo to developers that Portable OS/2 will serve a small portion of the high-end market but will "only win over the competition because it runs Windows applications natively."

In a briefing slated for Jan. 29, Microsoft is expected to detail plans for a 32-bit Windows, called Windows 3.2, or Win32, and New Technology Portable OS/2. A spokeswoman said Microsoft will continue to support and place the Presentation Manager application programming interfaces in future products.

However, sources interviewed last week said they remain convinced Presentation Manager could wither on the vine unless IBM steps in. Developers said Microsoft's software merger plan is targeted at pushing Windows applications.

During the next 12 to 18 months, users will still be faced with two very similar 32-bit options as Microsoft's Windows and IBM's OS/2 Presentation Manager continue battling to claim the desktop standard.

Both systems will run DOS and Windows applications and feature preemptive multitasking, multiple threads, the High Performance File System and Named Pipes support, sources said. But Win32 is expected to improve on OS/2's graphics.

During the last two years, Microsoft and IBM have publicly attempted twice to patch up their differences over Presentation Manager and Windows. In September, IBM took control of the 32-bit OS/2 2.0, while Microsoft received responsibility for its successor, Portable OS/2.

There has been a growing debate for some months as to whether Microsoft will wash its hands of future Presentation Manager application programming interface support. "From the documents that we have seen from Microsoft, it is clear that Microsoft is not going to do anything at all on OS/2, that OS/2 will stop playing a role in their future operating system strategy," one source claimed.

Still, Microsoft has to be sensitive, Diamond said. "They sold 4,500 OS/2 developer kits and another couple of thousand OS/2 32-bit developer kits. Now they are going to turn the tide around and tell these people that if they are smart, they'll develop for Windows."

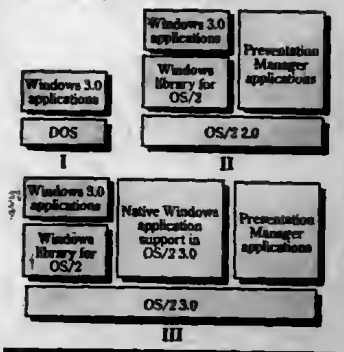
These developers and users are being briefed by IBM on its plans for OS/2 2.0. IBM began shipping early releases of OS/2 2.0 to select customers late last month and is expected to ship an upgrade in March.

According to sources briefed by IBM on OS/2 2.0, key changes will show up in a more attractive OS/2 2.0 will include:

- Full support for commercial DOS- and Windows-based applications running in virtual mode. "We are committed to providing that," an IBM spokeswoman said.
- A Virtualized Device Driver, which will ensure that users will be able to take any DOS-based card or device driver and run it under OS/2 2.0.
- Simultaneous support for OS/2 LAN Server and Novell, Inc.'s Netware.

Triple-glazed Windows

Microsoft's Windows applications are envisioned gaining some compatibility with OS/2 Version 2.0 and native support in OS/2 Version 3.0



Source: Forrester Research, Inc. CW Chart: Paul Mock

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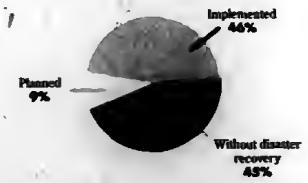
TRENDS

Despite the considerable investment in the data center, many IBM plug-compatible mainframe sites have not committed to any formal backup plans

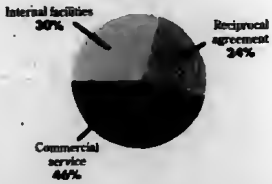
Disaster recovery use

Percent of U.S. IBM Plug-compatible mainframe sites
(Base: 1,600)



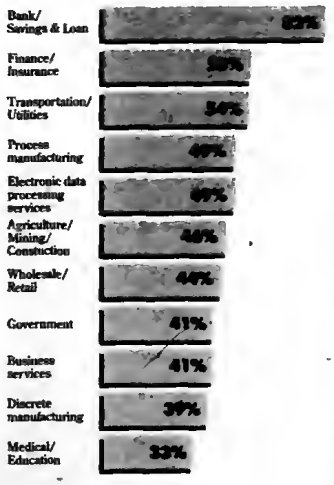
Implemented contingency plans

Percent of U.S. IBM Plug-compatible mainframe sites
(Base: 736)



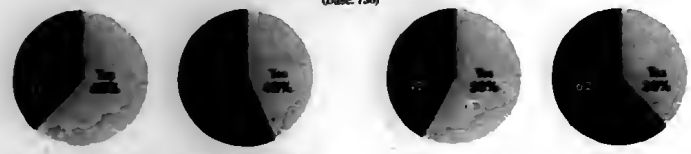
Industry penetration

Percent of U.S. IBM Plug-compatible mainframe sites with a contingency plan
(Base: 736)



Common attributes

Does your site employ contingency plans?
(Base: 736)



$5 million and higher | Less than $5 million
(Estimated purchase value of installed systems)

3090 series sites | 9370 sites
(Size of mainframe processor)

Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monahan

NEXT WEEK

Out of work? Keep your chin up, believe in yourself, assess your skills and take your job hunt seriously, advises **George Francis** in next week's Careers section. After seven years at the same firm, Francis was laid off and spent nearly a year seeking another job. In the end, the 30-year IS veteran discovered his niche and wound up with three offers.

Reinhold Spangler

Hospital emergency rooms might seem an unlikely place for information technology. But health care administrators and information systems managers are waking up to ways in which IS can be used to assist emergency room documentation — and hospital profits. Find out more in an Industry Closeup: IS in Emergency Care, in Manager's Journal.

INSIDE LINES

Let me see your books

Oracle found itself caught between a rock and a hard place last week, as the international banking syndicate that had loaned it $250 million last summer demanded to audit Oracle's books before securing a renegotiated loan. Oracle had spent $170 million of that amount by December, according to a recent report just filed with the U.S. Securities and Exchange Commission. "The banks will secure the loan with the company's accounts receivable balance," said Mike Musson, director of investor relations at Oracle. "People are concerned because Oracle burned a lot of cash in the first part of the year, but we're moving toward positive cash flow from operations."

Movement at the top

Rumors are circulating among the Wang user community that Wang is secretly working on a new high-end VS system. Sources were undecided whether it would be a replacement or an upgrade for the company's top-of-the-line VS 10000.

Learning the OSI language

After talking a good Open Systems Interconnect (OSI) game for years, Ungermann-Bass should finally come up with some beef at Comnet '91 next week. The LAN server vendor is reportedly going to deliver on its promise to implement the OSI Common Management Interface Protocol on its network management system so that it can feed alerts and alarms to other OSI-compliant network management platforms.

Nervous employment ranks

War, recession and IS executive unemployment. So far, these may be the three major themes of the year. Art Gillis, a veteran consultant and former IS executive in the banking industry, had this to say last week: "We're in the 17th day of the year, and I've already had more [IS managers] calling me for job leads than I had in all of 1990."

Chief consulting officer

As if IS positions in the banking industry haven't been volatile enough, now a top banking IS consultant has switched jobs. Bill Synnott has left Nolan, Norton & Co. to start his own firm, W.R. Synnott & Associates. He remains a Nolan, Norton associate. Synnott is sometimes credited with coining the term "CIO," and he was one himself — at Bank of Boston.

Getting down to business

Early next month, Hewlett-Packard will unveil low-end reduced instruction set computing (RISC) systems, according to analyst John Dean at Salomon Brothers. Analysts have said that HP lost market share in 1990 because its RISC line did not extend down to inexpensive workstations.

Programming Windows

Borland International is expected to stake out a claim as a major player in the Windows development world next month at the Software Development Expo when it rolls out Windows programming extensions stop a new version of Turbo C++.

Good timing

Just as word went out that Informix Software was in a mighty deep financial stew (see story page 7), along came the news that HP will team up with the relational database management system vendor at Uniforum this week to unveil their Opencase strategy for providing commercial-grade Unix computer-aided software engineering tools on HP platforms. Third parties will also be involved.

As the flood of financial reports crested last week, many noted the Gulf situation and its impact on the world economy, some whined about its expected impact on future reports, but only IBM Chairman John Akers had the class to lead off his report offering up prayers for U.S. military forces in the Gulf. As a former Navy jet pilot, Akers may have a better perspective on the bigger picture than other CEOs, some of whom weren't even eligible for the last Selective Service draft. Computerworld *contacts: News Editor Pete Bartolik, (800) 343-6474; fax, (508) 875-8931; Compuserve,* 76537,2413; *Prodigy, MHTS78A; MCI Mail,* COMPUTERWORLD.

for the Terminal Blues

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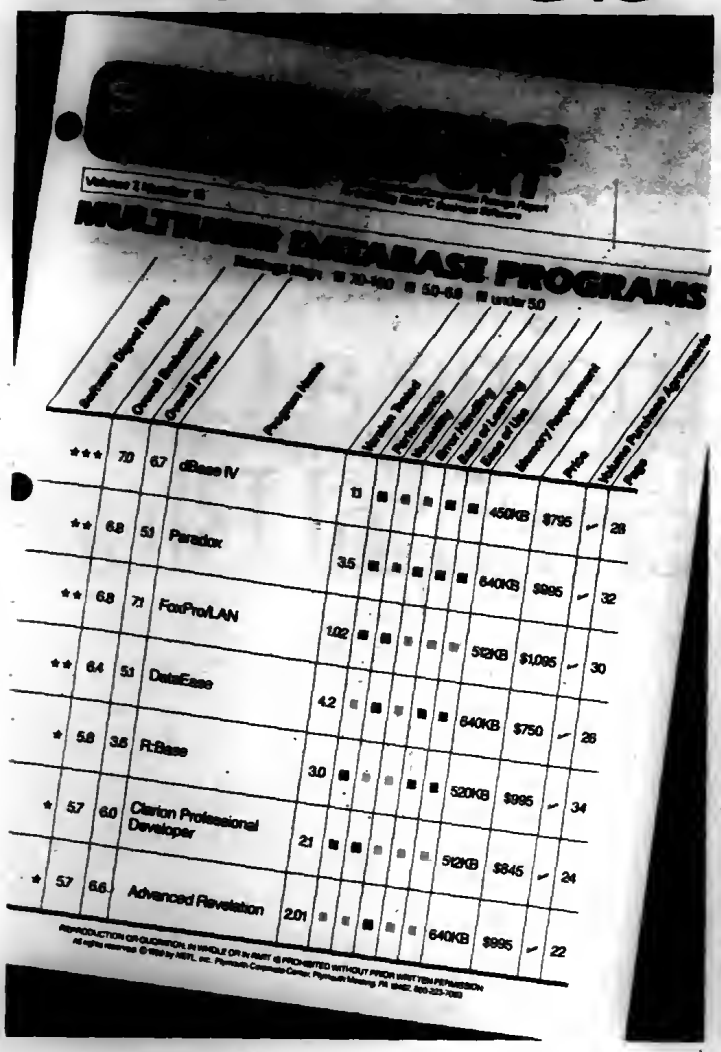

MULTIUSER DATABASE PROGRAMS

Software Digest Rating	Overall Evaluation	Overall Power	Program Name	Version Tested	Performance	Networking	Error Handling	Scope of Learning	Ease of Use	Memory Requirement	Price	Volume Purchase Agreements	Page
★★★	7.0	6.7	dBase IV	1.1	■	■	■	■	■	450KB	$795	✓	28
★★	6.8	5.1	Paradox	3.5	■	■	■	■	■	640KB	$995	✓	32
★★	6.8	7.1	FoxPro/LAN	1.02	■	■	■	■	■	512KB	$1,095	✓	30
★★	6.4	5.1	DataEase	4.2	■	■	■	■	■	640KB	$750	✓	26
★	5.8	3.6	R:Base	3.0	■	■	■	■	■	520KB	$995	✓	34
★	5.7	6.0	Clarion Professional Developer	2.1	■	■	■	■	■	512KB	$845	✓	24
★	5.7	6.6	Advanced Revelation	2.01	■	■	■	■	■	640KB	$995	✓	22

The new dBASE IV® version 1.1 has been rated the #1 Multiuser Database by Software Digest Ratings Report (Volume 7 Number 3, October, 1990).

Because Software Digest accepts no advertising whatsoever, subscribers pay hundreds of dollars a year to receive their reviews—which are considered highly unbiased and objective.

In summation, their 75-page report says: "Among the top ranking programs, dBASE IV (version 1.1) is the most well rounded, with solid performance, versatility, and usability." Commenting on speed, Software Digest points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use/Ease of Learning, dBASE IV scored as many times in the Excellent range as any other database product tested.

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